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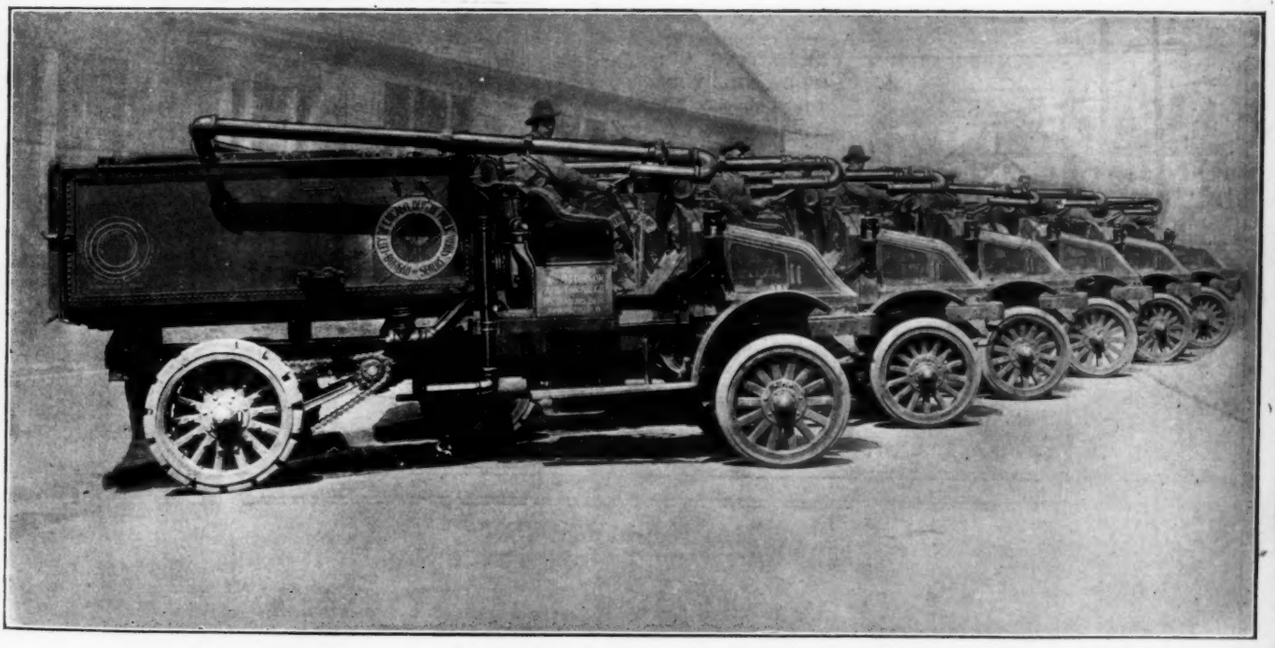

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Table of Contents, Page 3 Index of Advertisements, Page 38

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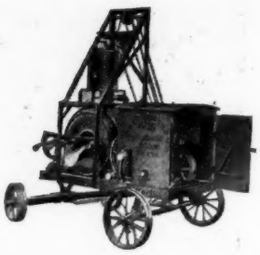

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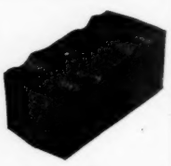

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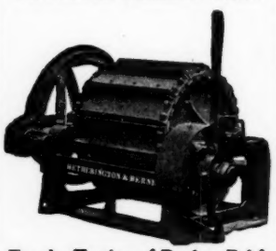

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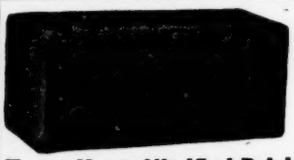

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Municipal Journal

Volume XLIV. NEW YORK, MAY 18, 1918 No. 20

SEWAGE TREATMENT AT COLUMBUS

First Year's Operation of the Two-Story Settling Tanks That Replaced the Original Septic Tanks—Odor and Sludge Give Less Trouble—Insufficient Capacity of Sprinkling Filters Causes Unsatisfactory Effluent.

The sewage treatment plant at Columbus, Ohio, has, during the past two years, been undergoing considerable changes which have interfered with its regular effective operation, and it seems probable from the experiences of 1917 that further changes or extensions are desirable, if not necessary. During part of 1915 and 1916, septic tanks that formed part of the original construction were changed into two-story tanks of the Imhoff type and part of the new tanks were used in 1916, but the entire installment of two-story tanks was not ready for service until 1917. The result of the first year's operation of these tanks was of considerable interest, one feature of which is the comparison which it permits between results obtained by septic and Imhoff tanks.

As in previous years, the plant was not operated during the entire year, but only during the months of May to November, inclusive. At other periods of the year, and during high water, the sewage is discharged directly into the river without treatment. The total amount treated during 1917 was 4,082,000,000 gallons, the mean daily amount being 20,830,000 gallons. This was derived from a population estimated at 220,000. The sewage is lifted at a main pumping station through 6,336 feet by a 48-inch force main to the sewage treatment works; 2,330 feet of 48-inch force main serving to carry the discharge directly to the river during high water. The pumps discharge against a head of about 24 feet. The maximum rate at which they operated during the year was 32,000,000 gallons per day, but the maximum pumpage in any one day was 26,840,000.

Before passing into the pumps, the sewage is screened. During the year the screens were cleaned 1,096 times and 2,222 wheelbarrow loads of screenings were removed. Provision was made for removing sand and refuse, and 3,330 wheelbarrow loads of this were removed. This large amount of heavy material is due to the fact that the sewers are on the combined system. The sewage is measured at the pumping station by means of a Venturi meter 48 inches by 20 inches, provided with indicator, recorder and register. The main pumping plant was in service about 197 days, or 54 per cent of the time. The total annual operating cost of the pumping station was $18,410, or $4.48 per million gallons pumped.

On reaching the treatment plant the raw sewage passes through the settling tanks and the effluent is oxidized by spraying it onto sprinkling filters. The effluent from these is passed through a shallow sedimentation basin for the purpose of removing the matter which leaves the sprinkling filters occasionally as they purge themselves. From these the effluent passes to the Scioto river. The sludge from the settling tanks is drawn off upon sludge beds from which, after drying to a consistency that will permit of its being shoveled into cars, it is hauled to a dump site. The solids deposited in the shallow sedimentation basin also are pumped to a disposal site.

The flow in the Scioto river varies from a minimum of about 5,000,000 gallons per day to an average yearly flood flow of 22,000,000,000 gallons per day and a maximum flood flow of 77,000,000,000 gallons per day. The average daily discharge from the sewage treatment plant is about 20,000,000 gallons. It is seen, therefore, that during the minimum flow of the river this is only one-fourth as great in volume as the sewage effluent; but that during average flood flow the river flow is about 1,000 times as great as the sewage effluent. The temperature of the river is a very important factor in determining whether or not the combined treatment and dilution are sufficient to prevent objectional pollution of the stream. When the quantity is small and the temperature is high, conditions are at their worst; but during times of flood the dilution is ample to prevent any nuisance whatever.

During last year the average amount of settleable solids, based on daily composite samples, was 3.28 C. C. per liter, or 438 cubic feet per million gallons. The total suspended solids in the crude sewage averaged 231 parts per million, 56 per cent of the total suspended solids being settleable. The proportion of settleable to total suspended solids in Columbus sewage is believed to be unusually low and subsidence of the solids is unfavorably affected by long travel in the sewers and by the action of the centrifugal pumps that force it to the plant. The settling tanks removed 86 per cent by volume of the settleable solids, but only 55 per cent by weight of the total suspended solids.

The odor from the effluent from the two-story tank last year was not nearly as offensive as had been that from the septic tanks which they replaced, and in this respect the chemist in charge, C. B. Hoover, states that the experience was quite gratifying. During a part of the year there was some trouble with foaming, which had given a great deal of trouble when the first tanks were operated at an undesirably high rate, in 1916. This foaming causes the tanks to present a wretched appearance and also increases the odor. With adequate sludge disposal apparatus, however, it is believed that the foaming can be properly controlled.

Sludge drawn from the tanks after six weeks' storage was not particularly offensive. Four feet of hydrostatic head was available for removing the sludge, but this was assisted to a greater or less extent by water discharged

from a movable submerged pipe. It was found that sludge with 85 per cent moisture would not flow readily in the channels nor distribute properly over the long, flat sludge beds, but when the percentage of moisture was increased to 90 per cent the sludge would flow and distribute satisfactorily.

Experience with running the sludge onto the beds to different depths demonstrated that if the depth was 12 to 15 inches the sludge dried very slowly, but when it was reduced to between 6 and 8 inches the drying period was very materially shortened. As the sludge dried, shrinkage cracks opened up, and the material was found to be quite porous so that it drained out readily. The dried sludge has very little odor. It is hauled in cars and dumped on low land, but utilization of it as a marketable fertilizer was being investigated a few weeks ago with the co-operation of the garbage reduction works which are nearby.

The labor required to remove the sludge was 0.839 hours per cubic yard and cost 27.8 cents; in addition to which there was a cost per cubic yard for removing of 1.6 cents for gasoline and 0.1 cent for other expenses, giving total cost of sludge removed at 29.5 cents per cubic yard. During the year 2,163.66 cubic yards were removed and carried an approximate length of haul of 750 feet. This total amount of sludge was derived from 4,082,000,000 gallons.

Although the sprinkling filters were operated during 1917 with about the same dose per day as in 1916 (2.42 million gallons per acre per day for 1917, as compared with 2.34 million in 1916), and although the effluent was of lower concentration last year, the nitrification effect was considerably inferior in 1917, and consequently the quality of the effluent. There was an unusual amount of pooling and storage of suspended matter. Also there were scarcely any moth flies as compared to previous years. During 1917 there were 8.61 acres of sprinkling filters in service as compared to 8.29 in 1916, and the mean rate was 3.41 million gallons per acre per day as compared to 4.33 the previous year, and 3.64 during 1915. The average time in service was 17.01 hours, which is the highest since the sprinkling filters were put into service in 1910, the next highest being 14.36 hours in 1915. The filters removed 31 per cent of the total suspended solids contained in the effluent, and the whole plant removed 71 per cent of the suspended solids. The filters effected 65 per cent reduction in the amount of dissolved oxygen consumed in 24 hours at 37 degress C.; the reduction in this effected by the entire plant being 73 per cent. The stability value of the final effluent during 1917 was 31 per cent, having been 33 during 1916, 79 during 1914 and 84 during 1912.

The amount of total suspended matter in the effluent gradually increased from 42 parts per million in May to 114 in November, and the dissolved oxygen consumed increased from 33 parts in May to 64 parts in November, passing through a minimum of 24 parts in July. The stability value reached a maximum of 55 in July, dropping to 22 in August and 12 in October, rising gradually to 18 in November.

Examinations were made of the effluent of the river above the treatment plant outlet and at points 7, 11 and 16.3 miles below such outlet. The pollution of the river before reaching the treatment plant is indicated by the fact that the dissolved oxygen consumed averaged 4.3 parts per million just above the city, and, although increased to 6.9 in passing this plant and the city, fell to 2.5 parts 16.3 miles below. Commenting upon the result of these examinations, Mr. Hoover reports that they apparently warrant three conclusions: "(1) The degree of purification is insufficient to prevent exhaustion of oxygen in the stream during extreme low water stages and with a high river water temperature prevailing. The dilution in the stream at such times is often as low as one volume of river water to four volumes of treated sewage. (2) The degree of purification is sufficient to prevent exhaustion of oxygen in the stream during low water stages with low river water temperatures prevailing; also during normal river stages with high river water temperatures prevailing. (3) There is entirely too much pollution of the stream above the treatment works. This pollution should be stopped, and we recommend that this be brought to the attention of the proper city, township or county officials."

He believes that the insufficiency of treatment referred to in the first conclusion is due to overloading the sprinkling filters. During the first five years these filters were operated with a mean dose of 1.52 million gallons per acre per day, while the mean dose last year was 2.42 million gallons, or more than 50 per cent greater. Assuming 100 gallons of sewage per capita per day, this gives 24,200 population per acre of 5½-foot bed. During the first five years, the dissolved oxygen consumed by the effluent was 25 parts per million, while during 1917 it was 43 parts; and the average stability value of the effluent during the first five years was 76 per cent, while it was only 31 per cent last year. The amount of sewage treated daily has increased from a mean of 11.4 million gallons in 1910 to 20.8 in 1917.

It certainly would seem to be almost imperative that the plant be further extended and improved, since in September, for example, with the river at its lowest stage, the stability value of the effluent was but 13, and the river 7 miles below the plant contained no dissolved oxygen, consumed 11.5 parts of dissolved oxygen, and had a stability value of only 3, which had increased to 43 four miles further on. The condition of a river which, seven miles below the treatment works, has a stability value of only 3 and contains no dissolved oxygen, would certainly seem to call for some action by the State Board of Health; and it would appear that a considerable extension of the sprinkling filter area is necessary. What would be the result if the filters had to be operated continuously is indicated by the steadily decreasing effectiveness of the plant during the seven months that it is operated.

The cost of operation per million gallons treated has decreased from $3.91 in 1911 to $1.84 in 1917. Since the cost per million gallons last year was very much less than during the first five years of operation and was less than 4 cents per capita, there seems to be no possibility of advancing the argument that the city cannot afford to spend more money on the sewage treatment plant. It would appear from the figures that an issue of bonds sufficiently large to make the necessary extension could be carried without increasing the cost per million gallons to a figure much, if any, higher than the cost during the first few years of operation.

GRANITE BLOCK PAVEMENT IN WORCESTER.

Granite block pavements are laid in Worcester, Mass., with longitudinal expansion joints. The reason for this, as explained to the American Road Builders' Association by A. P. Rhodes, is because the vibration of traffic is transmitted too greatly through the curb and sidewalk to the abutting buildings unless this is done. Except for these joints, the pavements are filled with cement grout.

The grout for filler may be too thick for successful application. It should be of the consistency of rich

cream, but thin enough to run in easily. The grout can be run to the bottom of the joints by wetting the peastone used and throwing the stone into the grout as it is dumped on the street, instead of putting the stone in the joints first. A twin grout mixer is used, and with an improvement devised on the work, the capacity is doubled, the machine being able to grout behind two gangs of block layers and also to grout the concrete base ahead. Any surplus grout should be removed from the top of the pavement after it is completed.

Mr. Rhodes does not recut old granite blocks, but culls out the poor blocks for use in paved gutters on other classes of streets. Using the better blocks with grout filler, he thinks he gets streets as good as new, and he is not satisfied that the shallow recut blocks give a pavement sufficiently strong.

He has had some unfortunate experiences with heavy loads on steel-tired trucks and trailers running at speeds more than four miles an hour, which have very seriously worn granite block pavements in a short time. The granite blocks should not be too hard; if they are not, they will wear smoother than hard ones and at the same rate as the filler and the individual blocks will not lose their edges and produce a cobblestone effect.

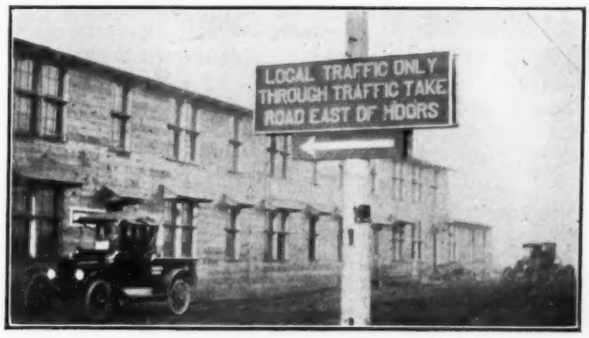
Worcester pavements are cleaned by flushing, using two flushing trucks and also flushers mounted on electric trolley cars. They do not injure the pavements, even those with sand filler.

STREET SIGNS AT CAMP CUSTER.

By CHESTER W. SHAFER.*

Army officials at Camp Custer, the national army cantonment near Battle Creek, Michigan, have made that new "municipality" understandable to the public and have adopted a system for public information which makes it possible for any one to find his way about this city of 7,200 acres. By the simple but liberal use of signs, visitors at the camp are able to proceed directly to their destination and a stranger can find his way to any part of the camp without the least confusion. The officials believe, in fact, that the system could be adopted with profit in many of the difficult civil communities of the country.

The camp is built on both sides of a concrete highway which runs through the entire camp from the east to the west. Signboards denote the avenues paralleling the highway and the streets that intersect it. With these signs alone the work of locating a barrack is not difficult. But to make it more simple, every branch of the service, the infantry, artillery, ambulance and others, is pointed out by huge signs placed on poles along the highway. All buildings of importance also are pointed out by means of signs.



Before this system was put into operation, visitors at the camp, arriving by the thousands on Sundays and holidays, spent most of their time asking the military police and officers where to find their soldiers. But with this system the work of locating a relative or friend is greatly simplified.

All motor traffic over the six-mile concrete road that connects the camp with Battle Creek, and also over the highway through the camp, is directed by a series of signs. The white commands govern all driving and regulate it so that there are few accidents. No horse-drawn vehicles are allowed on the highway. Whenever a stop is made, the driver is required to draw up on the shoulder of the road. In the eight months that the camp has been operated there have been no collisions.

*Mr. Shafer, who has contributed several articles to Municipal Journal, is a member of the 310th Sanitary Train at Camp Custer.

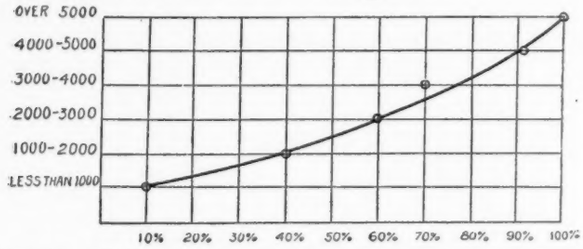
VALUE OF SEWERAGE SYSTEMS.

In the annual report of the New York State Board of Health, recently published, there appears an excellent presentation of the economical and sanitary value of sewerage systems, that we reprint below complete.

Of the 305 villages in this state that were incorporated before 1890 and of which complete population records are available, 32 per cent are provided with public sewerage systems. As may be expected, a greater per-

GUIDE BOARDS IN AND AROUND CAMP CUSTER.

centage of the larger municipalities are provided with sewers than of the smaller communities. Eight and one-half per cent of the villages having a population of less than 1,000 in 1890 are now provided with sewers; 38.8 per cent of the villages having populations of from 1,000 to 2,000 have sewers; 61 per cent of the villages between 2,000 and 3,000; 71 per cent of those between 3,000 and 4,000; 93 per cent of those between 4,000 and 5,000; 100 per cent of the villages having a population of more than 5,000 in 1890 are provided with sewers. The following curve shows graphically the relatively uniform rate of increase in the number of villages provided with sewers with the increased size of the villages.



CURVE SHOWING RELATIVE RATE OF INCREASE IN NUMBER OF VILLAGES PROVIDED WITH SEWERS WITH THE INCREASE IN THE SIZE OF THE VILLAGES.

Although the growth of a community does not necessarily depend upon its having a sewerage system, it is significant that the increase in population from 1890 to 1915 in New York state of those villages now provided with sewers was 43 per cent, while the increase in population of villages not provided with sewers was only 9 per cent for the same period. If the villages which have become cities since 1890, all of which are provided with sewers, were considered, the contrast would be even more marked. Many of the villages provided with sewers have increased in population from 100 per cent to 1,100 per cent in 25 years, while in only two villages not provided with sewers has the increase in population exceeded 100 per cent. It may also be noted that although 33 per cent of the villages without sewers have decreased in population since 1890, only 12 per cent of the villages provided with sewers have shown a decrease in population between 1890 and 1915. There can be no question therefore but that a sewerage system has considerable commercial as well as sanitary value.

SEWER PIPE JOINTS

Experiences of a Number of Engineers in Securing Tight Joints—Use of Cement in Various Ways, Sulphur-Sand, and Bituminous Compounds.

A few weeks ago the subject of sewer pipe joints was discussed at a meeting of the Boston Society of Civil Engineers, by seven of the members, and many interesting experiences and details of practice were brought out. The necessity for tight joints in separate sewer systems, both to prevent the seepage of ground water and the entrance of tree roots, was recognized, and most of those entering into the discussion had endeavored to secure such joints by the use of materials other than cement mortar. However, L. W. Hastings, city engineer of Cambridge, believed that the "cement joint is likely to give as good results as any. I believe, however, that the poured grout is the best way in which to use it and get a full joint. Various devices have been suggested for holding the cement grout in place when poured. A very simple and inexpensive one is a sort of band or collar made of paper fabric about 2½ inches wide, one edge of which is attached to the bell of one pipe and the other edge is attached to the body of the next pipe, by cords passing around the pipe and firmly binding the collar to it. The grout is then poured into the joint space through a hole in the collar until it is entirely full. The collar can be left in place, as the cost of it is very small."

George A. Carpenter, city engineer of Pawtucket, R. I., has reported having used nothing but the old-fashioned mortar joint, with the more or less recent improvement of using a strip of cheese-cloth to hold the mortar in place.

Variations in the use of Portland cement were described in several of the discussions. Mr. Varney said that he had tried constructing wooden boxes to fit the lower half of the pipe and long enough to extend each side of the bell, which were set to proper grade and then filled with rich mortar so that there could be no question that each joint was thoroughly bedded and protected. In another instance, he encased the entire pipe in 6 inches of concrete; but in each of these cases there was still considerable leakage. Mr. Brewer found the use of the jute gasket more of a nuisance than a help, because in a great many places it was not properly calked into place and after the contract was completed there was hardly a section of sewer which did not show on examination either a string or loop of jute protruding into it. He believed that when used with a large follower, large enough to fully clean the inside of the pipe, the gasket is not necessary and is not as permanent as the cement, and he has abandoned its use. He found that rich mortar joints, one cement to one sand, uniformly pressed into the space between bell and socket and wound with cloth would keep out tree roots. "It accommodates itself to the slight movement which every pipe experiences before backfilling is completed. Moreover, if given a chance to set up without being seriously disturbed, such a joint is nearly watertight. The discovery of the use of the cloth wrapping is one of the greatest improvements in sewer jointing yet introduced. It gives the skilled pipe layer an excellent opportunity to pull and push and smooth the mortar into place and protects the mortar during backfilling. (This method of using cloth was described in "Sewerage" eighteen years ago, and had been used by the author for some years previous.) Mr. Marston also referred to the use of the cloth wrapping by Metcalf & Eddy but stated that, although the use of such wrapping was of value in preventing the bottom of the joint from falling off, it has been found difficult in contract work to get sufficiently watertight joints with Portland cement. He described at some length the Weston sheet metal form and gasket for pouring cement grout joints. (This was described in Municipal Journal for April 12th, 1917.)

Of the other materials used, the earliest referred to was a mixture of sulphur and sand. The method of using this was described most fully, and its use was apparently found most satisfactory, by Edwin H. Rogers, city engineer of Newton, Mass., whose description was as follows:

> The city of Newton, Mass., has a separate sewerage system, and for the past eleven and one-half years a sulphur and sand compound has been used exclusively as a jointing material for its vitrified pipe separate sewers and house connections, and for a limited amount of storm sewers.
>
> From June, 1906, to January, 1918, 28½ miles of vitrified pipe sewers and 31½ miles of vitrified pipe house connections have been laid with this compound of sulphur and sand. The size of the pipe sewers so jointed varies from 8 ins. to 20 ins., but 89 per cent of these sewers are 8-in. laterals. The house connections are 5 ins., with a few cases of 6 ins.
>
> The method of making the joints in the pipes is similar to the pouring of lead joints in water mains. After fitting any two pipes closely together, the joint is calked with

jute oakum, usually about ½ in. to 1 in. in depth, but only sufficient to prevent the jointing material from running into the interior of the pipe. A pipe jointer is then placed around the outside of the spigot end of one pipe, close against the bell of the adjacent pipe, leaving a triangular opening on top of the pipe through which the joint is poured full with the molten mixture of sulphur and sand. A ladle large enough to hold sufficient material to pour the joint completely full at one operation should be used, and sufficient time given for the sulphur and sand compound to harden before removing the pipe jointer. After removing the jointer, the exposed surface of the sulphur and sand mixture is painted with hot roofing pitch to close up any possible voids or slight temperature cracks. It may be questioned if this practice is an absolute necessity, but the cost per joint is but slight, only about half a cent per joint, and is an added precaution for watertightness. The Tee branches provided for future house connections are closed with a stopper held in place by roofing pitch, so as to be readily removed when necessary to make a connection with a house connection.

The sulphur and sand are mixed in equal parts by measure and melted together in an iron pot held in an iron frame and suspended over a fire of waste wood. Gasoline furnaces were previously used, but owing to the increased cost of gasoline the mixture is now heated by waste wood, which is almost always to be found on a piece of sewer work. When gasoline was used for fuel for melting, it required about .07 of a gallon of gasoline per joint.

The correct temperature to which the compound should be heated for use averages 260 degrees F. The use of a thermometer is unnecessary after the workmen become accustomed to handling the mixture, as the correct temperature is easily ascertained by inspection. If it is too cold, it will not flow properly, and if too hot the tendency is to foam in the kettle. The use of the compound does not involve any waste material, for that which is left unused in the kettle is melted the next time it is wanted and fresh material added, together with any fragments left from defective joints from leakage around the jointer in pouring the joints.

The sulphur is powdered sulphur of commercial quality, bought by the barrel. The sand is a very fine quicksand, which is obtained from a pit on the city of Newton waterworks reservation in the town of Needham. A great deal of the success of this type of joint depends on the fineness of the sand. Tests of the sand in use indicate that 90 per cent will pass a sieve having 100 meshes per linear inch and 50 per cent will pass a sieve having 200 meshes per linear inch. The pitch is ordinary roofing pitch. The jute is the usual type of tarred jute oakum. The pipe used is invariably deep and wide socket, as the annular space between the bell and spigot in standard pipe is considered too narrow for the best work.

The cost of sulphur varies from 2½ cents per pound in 1907 to 3 cents per pound in 1910, and 4.35 cents per pound in 1917. The sand is charged to each piece of work at the rate of $1 per barrel of 250 pounds or 0.4 cent per pound. The cost of the jute varies from 5½ cents per pound in 1918 to 8½ cents and 10 cents per pound in 1917. The cost of the pitch varies from 1 cent per pound in 1908 to 1.3 cent per pound in 1917.

The quantities of material per joint required for 8-in. pipe are about as follows: sulphur, 1½ lbs.; sand, 1½ lbs.; jute, ½ lb.; pitch, 0.4 lb. For 5-in. pipe the quantity of sulphur is about nine-tenths pound, and other materials in proportion. On the basis of present-day prices, the cost of materials for an 8-in. joint would be from 11 cents to 12 cents, but until recently the cost has been considerably less.

In 1907 a careful comparison was made of the cost of laying an 8-inch. pipe sewer of 38 cement joints with an 8-in. sewer having 31 sulphur and sand joints. This test, which included the labor and materials for laying the pipe in both instances, showed a cost of 26.5 cents per joint and 23.8 cents respectively, or that the sulphur and sand joint cost 90 per cent of the cement joint.

The advantages of the sulphur and sand joint appear to be many, and the following may be taken as the principal reasons for its use. When properly made, it is practically proof against leakage or infiltration and is entirely resistant to tree roots, while at the same time it is not complicated and is readily executed. There appears to be no material difference between the cost of sulphur and sand joints and cement joints, and whatever difference there may be is a small percentage of the cost of the sewers. In laying pipe up to 8 in. in diameter inclusive, three lengths of 3-ft. pipe can usually be jointed on the bank, where a perfect joint can be made with great ease and then lowered into the trench, and in the case of 10-in. or 12-in. pipe, two 3-ft. lengths can be so joined; whereas with cement joints the practice is to make every joint in the ditch. In other words, with the sulphur and sand joints in the smaller sizes of pipe, only 33 per cent, and in the medium sizes 50 per cent, are difficult of inspection, as against 100 per cent with cement joints. It requires excellent workmanship and vigilant inspection to make sure that cement joints are properly made, particularly at the invert of the pipe; whereas the sulphur compound tends to run around the bottom of the pipe and make the joint most secure at this point. No difficuly is experienced in cold weather by the use of the compound. In extreme weather and when the pipe is cold, it is easily heated by putting a string of tarred jute around the pipe at the joint and setting it on fire, thus heating the pipe sufficiently so that there is no difficulty in running the joint. After the joint is made, freezing weather will not hurt the sulphur compound, whereas cement joints should be protected from frost until the mortar is set. The time of setting of the sulphur compound is inconsiderable, for it is hard as soon as it is reasonably cool, whereas cement joints require a considerable period to harden.

Sulphur and sand joints are not flexible, but this is true of cement joints; and where there is a good foundation, nonflexibility in the sewer is no detriment in its construction. The sewer is usually placed at the lowest level of any of the structures in a street, and when it is laid in any material that provides a good foundation and is not susceptible to settlement, there appears to be no disadvantages in a rigid joint, and in fact the rigid joint will frequently assist in maintaining the grade and alignment of the sewer.

The soil in Newton through which the sewers are laid is mostly hard pan, gravel, sand or ledge, there being but little subsoil of peat or of filling. The sewers are under constant inspection, and breakages are of very infrequent occurrence, there having been but two or three breaks in the 60 miles of pipe jointed with the sulphur compound since its use was adopted from settlement of the foundation of a sewer or house connection.

Trouble is frequently encountered from tree roots on nearly all of our sewers which are laid with cement joints in which there are trees along the side of the street, and the same is true of the older house connections laid with cement joints with trees in the near proximity. We have had absolutely no trouble from the growth of tree roots in sewers or house connections laid with sulphur and sand joints.

The sewage in Newton is largely from dwelling-houses, but no difficulty has been experienced with deterioration of joints from sewage from any of the comparatively few mills or factories, the sulphur and sand compound being affected only by chemicals which are most rarely found in the trade wastes from manufacturing establishments and not at all in dwelling house sewers.

(To be continued.)

WATER WORKS OPERATION—DISTRIBUTION SYSTEM.

Data Concerning Services That Should Be Recorded —Securing and Recording Data—Office Records and Field Books—Scales of Maps and Records.

RECORDS OF SERVICES.

In many of the older cities, records of corporation cocks and house connections have not always been kept with sufficient completeness and detail, and a number are not supplied with curb cocks and boxes. The result is that in some of these cities there is believed to be a considerable amount of loss of water through abandoned services whose exact location is not known; and to dig up an entire street to find one or two possible leaking services is not to be considered, even though the aggregate loss of water from hundreds of such services is very large. And to think that five minutes taking measurements and notes of each service when it was made would have avoided all this trouble!

No part of an underground system should be covered up before it is so definitely located that it can be found without trouble at any future time. In the case of a service, the exact location of the corporation cock should be measured from permanent objects. Probably the

CLEANING MAINS, LEAKAGE AND METERS (Continued).

City and state	Do mains need cleaning at intervals?	Method of cleaning	Methods of detecting and preventing leakage and waste	Is leakage enough to make radical action desirable?	Percentage of services metered	Owner of meters*
Iowa:						
Boone	Yes	Flushing	Sounder	No	100	City
Burlington	No	.....	Surface indications, inspect sewers	No	4	Company
Cedar Falls	No	.....	Inspection	....	80	City
Cedar Rapids	No	.....	None	No	100	City
Creston	....	None	Inspection	....	95	....
Ft. Madison	No	.....	None	No	30	Company
Hawarden	....	.....	Leak detector	No	100	Both
Maquoketa	No	.....	Leak detectors and flow in sewers	No	100	City
Sioux City	No	.....	.....	No	100	City
Spencer	No	.....	None	No	50	City
Stanton	No	.....	.....	No	100	Consumer
Vinton	Yes	Flushing	Meters	No	100	Consumer
Washington	....	Flushing	None	....	....	....
Winterset	No	.....	.....	No	100	Consumer
Kansas:						
Chanute	....	.....	None	....	100	City
Coffeyville	No	.....	Observation	No	95	City
Council Grove	Yes	Flushing	None	Think not	80	Consumer
Emporia	Yes	Flushing	Inspection and microphone	Think not	100	City
Fredonia	No	.....	Inspection and meters	No	80	City
Great Bend	No	.....	None	No	100	Company
Hiawatha	No	.....	None	No	100	Consumer
Horton	Yes	Flushing	None	No	100	City
Independence	....	None	Inspection and aquaphone	No	65	City
Larned	No	.....	None	No	99	City
Manhattan	Yes	None yet	Meters	No	100	City
McPherson	No	.....	Repair when found	No	99	City
Neodesha	....	.....	None	No	100	City
Newton	No	Flushing	Sounders	No	95	City[g]
Osage City	No	Flushing	.....	No	100	Consumer
Osawatomie	No	.....	None	No	90	Consumer
Topeka	....	None yet	None	No	100	Consumer
Wellington	No	.....	Meters	Yes	95	Both
Kentucky:						
Hopkinsville	No	.....	Listening at hydrants	No	55	Company
Lexington	No	.....	.....	No	100	Company
Louisville	Not now	Pipe cleaning mach.	None	No	8	Company
Paris	....	Flushing	Testing services	....	10	Company
Richmond	....	Flushing	Inspection	No	15	Company
Shelbyville	No	Flushing	Inspection	No	100	Company
Louisiana:						
Kentwood	Not yet	.....	Inspection	Yes	None	....
Ruston	....	.....	Meters	No	90	City
Maine:						
Augusta	No	.....	.....	No	15	City
Calais	No	.....	Alertness	No	Few	Company[g]
Farmington	No	.....	.....	No	0.4	Company
Fort Kent	Not yet	.....	None	No	None	....
Norway	Yes	Flushing	None	No	One	Company
Van Buren	No	Flushing	.....	No	None	....
Sanford	....	.....	Pitometer	No	97	Company
Maryland:						
Baltimore	No	.....	House inspection & pitometer	....	4	City
Massachusetts:						
Adams	Yes	Flushing	.....	No	....	City
Athol	....	Flushing	.....	....	5	City
Barre	....	.....	.....	No	16	Both
Belmont	....	Flushing	Meters on by-pass	No	100	City
Cambridge	....	By contract	House inspection	No	35	City[h]
Cherry Valley	No	.....	.....	No	50	City
Danvers	No	.....	.....	No	Factories	City
Falmouth	....	Flushing	Inspection	No	Few	City
Fitchburg	Yes	Flushing	Inspection	No	99	City
Framingham	Yes	Flushing	Meters	No	100	City
Franklin	No	.....	Leak location; gen'l inspection	No	100	City
Haverhill	Yes	Replace them	Test in sections	No	36.2	City
Lenox	No	Flushing	Venturi meter	No	94	Company
Mansfield	....	.....	.....	No	60	Both
Medway	No	Flushing	None	No	50	City
Millbury	No	.....	Inspection	No	70	Both
Monson	....	Never cleaned	None	No	50	City
No. Adams	Yes	Flushing	Pitometer in 1915	Yes	20[l]	City
Northampton	Yes	Flushing	House inspection	No	3.3	City
Orange	No	Flushing	.....	No	100	Consumer

*The word "city" is used to designate municipalities of any nature or water districts; g—consumers own a few; h—detector meters on fire supplies owned by consumers; m—survey being made at present.

most permanent are the center or side lines of streets; and the cock may be located as so many feet out from the side (or property) line and a measured distance along such line to the nearest intersecting street line. References to trees may be used, but trees may disappear, as may also buildings; but street lines can always be located. If the service pipe is laid at right angles to the curb (as it usually should be), this sufficiently locates the entire line. If laid at an angle, its intersection with the curb line also should be located. The depth below the street surface at the main and that below the curb should be measured and noted.

There should also be recorded the thickness of lead goose-neck and other pipe used. Some time the pressure on the system may have to be increased, and it will be desirable to know what services probably will and what ones will not be able to stand the higher pressure. The size should be known; it may be necessary to know, at

METERS. RATES. MUNICIPAL USE.

City and state	Is deposit on meter required?	Is rental charged for meters? †	Does city obtain water without payment?	Use made of free water	Used for Municipal Purposes: Percentage	Used for Municipal Purposes: Is any of it metered?
Iowa:						
Boone	No	No	Yes	Flushing & fountains	5	Schools
Burlington	From strangers	No	Yes	Fountains	.....	No
Cedard Falls	No	No	Yes	Street and sewer flushing, fountains, fire	20	Schools
Cedar Rapids	.....	Minium charge	Yes	Sewers, street sprinkling, fire	50	Yes
Creston	.....	.....	No	.....	.....	Schools and street flushing
Ft. Madison	No	No	Yes	Watering troughs	.....	No
Hawarden	Non-owners	$1.00	Yes	Sprinkling and fountains	.....	No
Maquoketa	No	10% of cost	Yes	All city purposes	.....	Schools
Sioux City	.....	.....	Yes	All purposes	.....	Schools
Spencer	No	No	Yes	Sewer flushing, street cleaning, fire	0.5	No
Stanton	.....	.....	No	.....	15	Yes
Vinton	Yes[f]	.....	....	.....	.50	Some
Washington	Yes	No	....	.....	.....	.....
Winterset	.....	.....	Yes	City park	20%	No
Kansas:						
Chanute	Yes	No	No	.....	1	No
Coffeyville	Yes	No	No	.....	5	Buildings
Council Grove	No	No	Yes	Flushing sewers, schools, fountains	10[b]	No
Emporia	No	Large meters only	No	.....	0.5	Yes
Fredonia	$2.25	No	Yes	Flushing sewers and streets, fire	.....	Schools
Great Bend	$2.50	No	Yes	Street sprinkling, park irrigation and all public buildings	60	Yes
Hiawatha	.....	.....	Yes	Fountains, street use, fire	5	No
Horton	Yes	Yes	Yes	Sewers and fire	.....	Schools
Independence	$2.00	No	Yes	Flush tanks, flushing streets, water troughs	.....	Schools
Larned	Yes	No	Yes	City offices	10	Schools
McPherson	Yes	Yes	No	.....	20	Yes
Manhattan	No	Yes	Yes	All municipal purposes	25	No
Neodesha	Yes	No	Yes	Sewers and fountains	.....	Schools
Newton	No	Yes	....	.....	.....	No
Osage City	.....	.....	No	.....	.....	All
Osawatomie	.....	.....	Yes	City building and flushing sewers	5	No
Topeka	No	No	No	.....	60	Schools and parks
Wellington	No	Yes	Yes	Sewers, fountains, parks, cemetery	20	Schools
Kentucky:						
Hopkinsville	Yes	No	Yes	Schools and fountain	4	Yes
Lexington	No	No	Yes	Sewers, street cleaning, etc.	2	All
Louisville	Yes	No	Yes	All municipal purposes	.....	No
Paris	No	No	Little	.....	.....	No
Richmond	No	.....	....	Hydrant rental pays for water used	.....	No
Shelbyville	$5	No	No	.....	10	No
Louisiana:						
Kentwood	.....	.....	Yes	Schools, churches and fountains	5	No
Ruston	No	No	....	.....	.....	.....
Maine:						
Augusta	No	No	Yes	All public uses	.....	No
Calais	.....	No	No	.....	.....	No
Farmington	.....	No	Yes	Flushing sewers	.....	.....
Fort Kent	.....	.....	Yes	Schools	.....	No
Norway	.....	No	No	Watering troughs and fire	Small	No
Van Buren	.....	.....	Yes	Schools and churches	.....	No
Sanford	No	No	No	.....	.....	.....
Maryland:						
Baltimore	No	No	Yes	Schools, streets and fire	14	No
Massachusetts:						
Adams	No	No	....	.....	.....	No
Athol	No	No	Yes	Watering troughs only	10	Schools
Barre	No	No	Yes	Street work	.....	Two schools
Belmont	No	No	Yes	Shade trees, streets, sewers, schools and fire	3	Schools and streets
Cambridge	.....	.....	Yes	All city purposes	4½	All buildings
Cherry Valley	No	No	No	.....	.....	School and water troughs
Danvers	Sometimes	No	Yes	All city uses	.....	No
Falmouth	No	No	No	.....	.....	.....
Fitchburg	.....	No	Yes	All city uses	20	Some
Framingham	No	For over 1 inch	No	.....	16	Yes
Franklin	No	No	No	.....	.....	All but drinking fountains
Haverhill	No	10% of cost	Yes	All city uses	.....	Schools
Lenox	No	No	No	.....	5	Schools & fountns.
Mansfield	No	No	No	.....	15	No
Medway	No	No	No	.....	Small	No
Millbury	No	Yes	No	.....	.....	Bldgs. & fountain
Monson	.....	No	Yes	Street sprinkling, schools, fountain, fire	1	No
No. Adams	No	No	Yes	Schools, public buildings, etc.	10	No
Northampton	No	No	Yes	Schools, public buildings, fountains, water troughs	.....	No
Orange	.....	.....	No	.....	.....	All

†Amounts given are annual rentals, in some cases reported as quarterly or monthly payments; b—estimated; c—rental charged when bill is less than $9 per annum; f—monthly payments until meter is paid for.

some future time, whether a larger building can be served with the old corporation and service pipe. The material should be on record. Danger from electrolysis, or the desire to use electric thawing of services, may make such knowledge valuable.

Not only should a record be made of the above items, but a record should be kept of the history of each service. For one thing, each service is a potential source of water to some one, and unless the department keeps in touch with each one, some may supply water surreptitiously without yielding revenue. A house may burn down, the service be closed at the curb, and forgotten; a new building may take the place of the old, connect to the old service without notifying the water department or company and use water for years without having a bill presented. A simple system can be devised that will render that impossible.

The superintendent should make sure that the desired notes are made and entered on the records concerning every service connection made while he is in office. If others have preceded him, he should assure himself that their records that he inherits are complete. The only sure way to learn the latter and to check his own records is to have a map of each street in which a main is laid, showing each house supplied by a house connection; check these connections off with his service records, and also learn by actual inspection on the ground whether there are not houses using the public water that are not on the service map.

Unlike valves and hydrants, which are generally at street intersections, services all lie outside of intersections, and can best be mapped and recorded by streets. In the loose-leaf service record book, or card index, one page or card, or two if necessary for long blocks, can be devoted to each block of a street, and all of those referring to each street arranged in order. A convenient plan is to have tracings of these made of note-book size, and from these take blue-prints that can be carried by the inspector. (A transparent card that can be filed in the index, or tracing cloth for the loose-leaf record sheets, would answer well for this purpose.) Changes or new services are all entered in the book or cards. As the blue-prints wear out they can be replaced by printing new ones. All the blue-prints referring to one street, or to several streets in one district, can be bound together in one loose-leaf pocketbook.

With a pocket record of the known service connections, an inspector should pass through each street at least once a year and note whether a service is recorded for each building thereon. If any building, new or old, is found not recorded as served, he should make sure whether in fact such building is not supplied with water from the mains; and should enter the building on the map if it is not already there.

There should also be records of the meters—their size, make, location, etc.; but these records will be considered in a separate discussion of meters and meter maintenance.

SCALES OF MAPS AND RECORDS.

The wall map giving the general layout of mains is generally made on a scale of about 100, 150 or 200 feet to the inch. The first can be used for villages or small cities not more than a mile by three-quarters of a mile in extent. For larger cities the 200-foot scale may still be too large and 300 feet may be used; but this is rather fine for showing sizes of mains and locations of valves and hydrants, and it is generally preferable (and necessary, if the city is very large) to divide the city into sections and show each section on a separate map.

The valve and hydrant records should be to a much larger scale, both so that the locations can be shown to proper scale and so that there will be room for figures giving distances that can be read easily. Ten feet to the inch is generally ample, and is convenient for use with an ordinary foot rule for a scale. Twenty or thirty feet may be used if desired. Forty feet is, in the author's opinion, too small to permit any but an excellent draughtsman to record all the desired dimensions and information clearly. (The reduced drawing of the loose-leaf record book shown last week was 30 feet to one inch, the original having been 10 feet to one inch.)

For the loose-leaf service record book, in which the records are on tracing cloth and blue printe of them are carried in pocket field books, a size of page of 4 by 9 may be used. A scale of 30 feet may be used, which will require two pages to show a block more than about 250 feet long. A better plan, although more expensive, is to use a larger record book in which the drawings are made to a scale of say 30 feet to one inch, and photograph each page to about one-third or one-fourth size, giving a print about 3 by 5 inches, and use prints from these negatives for the pocket field books. Photographs of similar size of the valve and hydrant records, and others of sections of the map, if bound together by districts so that each book contains all the service and valve and hydrant records for one district, with a section of the map covering that district, have been found very convenient for use outside the office.

FIRE-PROOF STORAGE.

These records are of great value, in that the loss of them would render it impossible to operate and maintain the plant properly, except in towns where all the information is accurately carried in the memory of the superintendent, and then only so long as that memory was unimpaired and at the service of the department or company. The map showing the layout of mains can be reproduced, however, if the other records are complete. These record books or card indexes should therefore be kept in a fire-proof vault or safe, and care taken to see that the office is never left alone without all of them being placed in such fire-proof receptacle and the door closed.

GARBAGE REDUCTION AT ST. LOUIS.

We are glad to publish the following self-explanatory comment by director Talbert on the news item that appeared in our April 13th issue:

Editor Municipal Journal,
New York, N. Y.
Dear Sir:

I note in your issue of April 13th an article on page 306 referring to the garbage situation, and in which you state that director Talbert has recommended to the service board that the present high price of grease and fertilizer will compel the city to pay close to $10 a ton for the green garbage delivered to the Indiana Reduction Company and "it will cost the city about $200 a day to conduct the experiment, Talbert says" * * *

The foundation for these figures is the following:

Grease at this time of the year averages about 3 per cent of the garbage, or 60 lbs per ton, which at 12c..	$7.20
Tankage about 10 per cent or 200 lbs—approximate market price $20 per ton or.....	2.00
Total value of products per ton.....	$9.20

Whether this $9.20 of ultimate value is achieved through the present reduction plant or through the experimental plant would in no way affect the net cost to the city of carrying on the experiment, which at the most would be the difference in the total value of the product which might result from the experimental plant being less efficient than the present one, but on the other hand should it prove more efficient there would, so far as the product is concerned, be an actual profit through the experiment.

Yours very truly,
C. M. TALBERT, Director.

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Contributions suitable for this paper, either in the form of special articles or as letters discussing municipal matters, are invited and paid for.

City officials and civic organizations are particularly requested to send to Municipal Journal regularly their annual and special reports.

Information Bureau.

Municipal Journal's Information Bureau, developed by twenty-one years' research and practical experience in its special field, is at the command of our subscribers at all times and without charge.

SEWERS AS A COMMUNITY INVESTMENT.

In an article in this issue citing figures from the latest annual report of the New York State Board of Health, it appears to be demonstrated that, at least so far as New York State is concerned, it pays a community in dollars and cents to install sewerage systems, entirely aside from considerations of the health of its citizens. It can hardly be due to chance only that, averaging 305 villages of that state and considering their growth over a period of 25 years, those provided with sewers are found to have increased in population 45 per cent, while those not so provided increased only 9 per cent. Moreover, many of those provided with sewers increased in population from two to eleven fold, while only two of those not provided with sewers more than doubled in population.

While mere bigness is by no means a virtue, it must be admitted that in most cases a community grows rapidly only when it offers an attraction for outsiders. A growing community is therefore a more desirable place to live in than one which hardly grows at all and does not retain even the normal increase due to the birth rate of its present inhabitants, but is driving away its citizens instead of attracting new ones. Moreover, a city that is not increasing in population is decreasing in property value and in prosperity, and either its taxes must bear more heavily on the citizens who remain, or these must be content to see its streets, its lighting and other public utilities deteriorating.

From the above figures and considerations it would appear that a sewered city, as compared to an unsewered one, is far more likely to be prosperous and attractive as a place for both residence and business purposes. Entirely aside, therefore, from its advantages from the point of view of health, and from that of the economy to the individual citizen as compared to the cost of constructing and maintaining cespools, sewers would seem to be essential to the full prosperity of a community as a whole.

IMPROVING COUNTRY ROADS.

While present indications are that the constructing and repairing of the higher grades of roads, such as brick and other block pavements, bituminous concrete and other forms of construction used on the main highways, will not be so seriously interfered with by freight embargoes, coal shortage and other limitations placed by federal commissions and imposed by war conditions generally as was feared a few weeks ago would be the case, it still seems certain that it will be impossible to carry on as much of this work as in previous years. Another consideration that has an important bearing upon the general question of road improvement is the necessity of economizing in all branches not immediately connected with the conduct of the war, and this will undoubtedly and very properly cause a reduction in expenditures that otherwise would probably be made.

These considerations add additional weight to arguments that were advanced, before present conditions arose, for giving more serious thought to the cheaper methods of road treatment, and to the improvement and maintenance of the by-roads where such cheaper and less durable forms are the only ones which the traffic carried would seem to warrant. The main highways, where the principles of highway economics justify an expenditure of $1.50 to $3 per square yard, constitute but a small percentage of the highway mileage of the country. By far the largest percentage consists of those that may be designated as country roads or by-roads, which are used to only a small extent by through traffic but are essential for bringing onto the main highways, and so to the markets and shipping centers, the produce raised upon the enormous number of farms that have no other outlet, and which serve as the only means of communication that those who live thereon have with the outside world and with each other. It is no more important that motor trucks and other vehicles carrying both freight and passengers should be able to pass freely at all seasons between the main centers than it is that the thousands of farms should be provided with roads that are at least passable during all but perhaps a few days of the year.

The latter roads, however, carry but a small amount of traffic each and no one of them can be said to equal in importance any one main highway, although they all in the aggregate play fully as important a part in the highway transportation of the country. Fortunately it is possible to maintain passable roads for a few vehicles at considerably less cost than to maintain them in an equally good condition under intense traffic. In many sections of the country the main highways have presented such engrossing problems to the highway authorities that these by-ways have been practically neglected; another factor leading to the same condition being that the average engineer or superintendent takes more interest in the construction and up-keep of a high-grade road than in that which he is apt to think of as an unimportant dirt road.

With the amount of high-grade road work diminished, however, it is to be hoped that more attention will be paid this year to dirt, gravel, sand-clay, and other cheap types of road surface, together with such comparatively inexpensive treatments of these materials as will add

to their effectiveness. Road drags and other appliances for smoothing out roads and potholes whenever they occur; ditching and drainage for preventing their occurrence; the use of available local materials for improving conditions at boggy places or where ordinary drainage methods are not adequate to prevent rutting and other disturbances of the surface; the application of dust layers or inexpensive binders for preventing the too rapid abrasion of the road and formation of excessive amounts of dust that are not only an annoyance but may also be harmful to growing crops along the road—each of these should be carefully considered in its relation to the local needs and possibilities.

These roads, it seems to us, make up in their number for the relative unimportance of each individually, and instead of being slighted as beneath the notice of experienced road engineers and superintendents, they should be recognized as offering an opportunity for, and demanding an exercise of, more intelligence and skill than do the high-grade roads. It may be said that in laying a road costing $1.50 per yard, five cents worth of brains should go into each yard. We believe that if only a fraction of that amount of brain value be applied to the country roads, it would be possible to put many of them into much better condition than they are in, at very moderate expense; in fact, that if no more is spent on these roads in the aggregate than is now done, but if one cent or even less per yard be allowed for the use of as high a grade of intelligence, experience and common sense as is now used on the more durable pavements, a great improvement could be made in a very large percentage of the tens of thousands of miles of these feeders that constitute the immediate points of contact with the food producing areas of the country.

BRICK PAVEMENTS FOR RURAL HIGHWAYS.

No fundamentally new features have been developed in brick pavements during the past year, said Clifford Older, state highway engineer of Illinois, before the American Road Builders' Association, but "well-directed efforts are being made to adapt this type of pavement to fit the necessities of rural road construction. It has become obvious that paved country roads which connect centers of population, or which serve considerable areas of farming country, will carry as heavy concentrated truck loads as the ordinary city business street, and must be designed accordingly.

"On the other hand, it appears that the chipping or spalling and abrasion action due to sharp shod horses and steel tires is becoming less pronounced, due to the motorization of traffic. When considerable stretches of rural roads become paved, motor traffic may be expected to predominate more quickly than on city streets on account of the greater length of the average haul. A brick wearing surface, laid now, may not be expected to wear appreciably under the traffic conditions likely to apply during its life. The eventual elimination of the spalling action of steel tired, horse-drawn traffic, as such traffic gradually disappears, leads to a tendency to go back to bituminous and sand fillers. As the use of either of these fillers obviously results in reducing the transverse strength or load-carrying capacity of the pavement below that of a pavement of the monolithic type having the same total thickness, the use of these fillers should be accompanied by a corresponding increase in the transverse strength of the base.

"For bituminous fillers, the growing tendency to use three-inch rather than four-inch brick seems logical, as the base, which is essentially the transverse strength element, may be made thicker and therefore stronger without increasing the total thickness or cost of the pavement.

"Three-inch lug brick used with a cement-grout filler, and laid directly on a concrete base or on a sand-cement bed on a concrete base, should give as satisfactory service as four-inch brick used in the same way, providing the total thickness of the pavement and the proportions used in the concrete base are the same. This conclusion is supported by the tests made by Prof. Wiley of the University of Illinois. These tests, while perhaps not conclusive, indicate strongly that the so-called monolithic types of brick pavements are truly monolithic as far as transverse strength is concerned. The three-inch brick used in this way should have ample wearing capacity for present traffic conditions, and has the advantage of economy of first cost. To use the same base for a three-inch as for a four-inch monolithic brick pavement under the same traffic conditions, or to substitute a bituminous filler, would be illogical. The unmistakable tendency to increase motor truck loads requires that more attention be paid to the transverse strength of pavements. Monolithic and semi-monolithic (sand-cement cushion) brick pavements are deservedly becoming popular. The greater difficulty encountered in rolling the brick to an even surface has lead to a tendency towards more rigid specifications for rolling and for brick of more uniform thickness than heretofore required.

"Brick of uniform thickness may readily be handled so as to produce the necessary smoothness of finished surface. The ordinary variation in thickness need present no serious difficulty if the base is carefully laid and the rolling is properly controlled.

"Arguments are being advanced for the use of water-bound and bituminous macadam bases for brick pavements for rural roads. It is the experience of the writer that for heavy motor truck traffic, and under the conditions of frequent rainfall which in Illinois at least makes it difficult and costly to prepare a uniform subgrade, it is economically impracticable to build a road of this character that will not become depressed in the wheel tracks or other well-defined areas. Old macadam roads of proper width and having suitable grades, if not worn out, may well be resurfaced and used for the base, as the weak spots are usually eliminated during the first few years of maintenance. Such roads are, however, hard to find in Illinois.

"There is a definite field for brick country roads where traffic conditions demand wear-resisting qualities, but in the opinion of the writer it would be a mistake to sacrifice any of the distinctive qualities of well-built brick pavements in order to bring them into competition with essentially cheaper types, or for any other reason."

TESTING SEWER HOUSE CONNECTIONS.

A suggestion is made by W. W. Dixon, of Lincoln, N. J., that plumbing codes require that house connections to sewers be tested for tightness under a 10 ft. head like the interior house plumbing, a T branch being inserted in the connection pipe at the curb line at which the pipe can be plugged for the test. (This T could later be used as a clean-out point.) This test would insure tight joints in the connection. We have several times referred to the desirability of having sewer connections tight, to prevent both pollution of the soil and the entrance of tree roots into the pipe. The suggested test would enable the property owner to learn whether the plumber has given him a tight pipe line and seems to us to be a good idea.

The WEEK'S NEWS

War Conditions on Highways of New Jersey, Illinois and New York—State Protects New York City's Watershed—Bayonne to Buy Water Plant—Fuel Conservation in Pittsburgh—New Jersey Cities Lose Rate Increase Case—Fires in Sault Ste. Marie, Ont.; Three Rivers, Que., and New York City—New York Public Service Commission Has No Power to Raise Car Fares—Chicago's Traction Fund.

ROADS AND PAVEMENTS

Road Wear by Federal Trucks.

Trenton, N. J.—Damage done to the roads of New Jersey by motor trucks employed in the government service was one of the subjects recently considered by the state road commission. Watson G. Clark estimated this damage at at least $1,000,000, and recommended that an appeal be made to the federal government for aid in reconstructing roads which have been destroyed in the vicinity of cantonments, military camps and points of embarkation. This view was shared by every member of the commission, and the appeal will be made. The commission decided upon an additional appropriation of $10,000 to improve the Bordentown-Georgetown road leading to Camp Dix in the event of failure to get federal aid for that purpose. Similar action was taken respecting the Lincoln Highway, between Newark and Jersey City, for the repair of which a contingent appropriation of $10,000 was granted. Before this money actually is expended the executive committee will make an effort to secure aid from the government. State highway engineer William G. Thompson informed the commission that owing to change in the date for the opening of the fiscal year, now July 1, from November 1, many of the counties will find it impossible to present plans and specifications and have contracts approved and requisitions drawn for their allotment of state aid before the expiration of the present fiscal year. He has been advised that the state controller's office will permit the highway department to file a blanket requisition June 30, covering the total amount of unexpended state aid, so that none of the counties will suffer. The commission ratified the suggestion of the department of conservation and development for a joint conference to consider plans for beautifying the state highway system by the planting of trees.

War Restrictions on Illinois Highway Plans.

Springfield, Ill.—No new contracts for state roads will be awarded by the division of highways of the state department of public works and buildings this year owing to the shortage of men and material and the need by the government of all the resources to prosecute the war, according to an announcement by the state department of public works and buildings. The department has sent out the following letter to county boards of supervisors and highway officials: "In response to numerous inquiries received from many counties of the state the department of public works and buildings, with the approval of Governor Lowden and the board of highway advisors, is authorized to make the following statement relative to the attitude of the administration on the question of road construction in Illinois during the present year. In view of the serious shortage of labor, transportation and materials that prevails throughout the country and the increasing demands of the government for all commodities in its prosecution of the war, and in accordance with the recommendation of the federal authorities, we believe it to be our patriotic duty to limit our activities in road construction this year as follows: First—To carry on only such maintenance work as is necessary to preserve the roads already constructed under the direction of this department. Second—To assist contractors, so far as we are able, in the completion of existing contracts previously made by this department. Third—To postpone the awarding and approval of new contracts for state aid roads, as advised by the federal government. Fourth—To cooperate with the federal authorities, so far as possible under existing conditions, in the improvement of those federal aid roads which they have approved as being necessary for the transportation of war materials, food products and fuel. We further urge that the present emergency calls for an unusual effort on the part of all township highway officials to maintain existing earth roads by a thorough system of dragging and draining." The letter is signed by Thomas G. Vennum, acting director; S. E. Bradt, superintendent of highways, and C. Older, chief highway engineer.

Law Provides for Suspension of Contracts.

Albany, N. Y.—Governor Whitman has signed the bill of senator Hewitt, amending the highway law by providing that when work under a highway contract is not being done satisfactorily the state highway commissioner may suspend any work being done by the contractor and proceed with it under his own direction, or may cancel the contract or relet it, and further providing for suspension of new highway construction work under certain conditions, upon request of the contractor and surety, until March 1, 1919, or during the present war, if it terminates earlier. Payment may be made for the portion of the work completed. In approving the bill Governor Whitman filed a memorandum of reasons, which stated some of the reasons for its approval given by the highway commission. "There are now upwards of 200 contracts in force, aggregating $12,000,000 in amount and 900 miles in extent. About 600 miles of work yet remains to be done, amounting to about $7,300,000. Of the 600 miles approximately one-half consists of roadway that has not been disturbed and remains as it was prior to the award of the contracts. The remaining one-half consists of roadway in various stages of completion, possibly graded, or bottom coursed, or sub-based. In 1917 the contractors were able to build only 370 miles of highway as compared with nearly 600 miles in 1916 and about 900 in 1915. It was very evident that conditions would be no better in 1918, and therefore no more work could be secured in 1918 than in 1917. It seemed advisable to attempt to concentrate the resources of men and road building materials on the completion, so far as practicable, of the torn-up portions of highway, which, as stated above, aggregate approximately 300 miles, and thus secure the best results for the traveling public rather than attempt to have the entire 600 miles completed, knowing that it would not be possible to accomplish this and realizing that it would leave a large amount of roadway impassable for traffic. The highway law as it now reads does not permit the commissioner of highways to take up the subject in the manner above indicated. It would be his duty to direct every contractor to proceed with his work, and upon his failure so to do declare the contract cancelled and proceed to complete it by releting or by department forces. The same conditions which would prevent the original contractor from completing his work would have prevented the department, with its own forces or under a new contract, from completing it, and the result would have been that the state would have been strewn with cancelled contracts, under which no work was

being performed, and traffic would be greatly embarrassed. After a careful study of the situation a conference was held at this office, at which a representative of the comptroller's department, the attorney-general's department and the executive department were present.

"In substance the bill provides that a contractor may unite with his surety company and request a suspension of work, under the following conditions:

"(1) Upon any portion or portions of roadway on which no work has been performed, except culverts, etc.

"(2) Upon any portion or portions which are partially completed, where it is proved that it is impossible to proceed, for the reasons provided in the law.

"Authorization for such suspension will be based upon an agreement executed by the contractor and surety company agreeing to maintain intact the obligation to complete at a future date the contract at the original contract prices. In the meantime, the commissioner is authorized to designate completion points, and when all the work within these points is finished it may be taken over, the contractor paid in full therefor, and the contractor relieved of the maintenance thereof.

"The period of suspension is to be in the first instance to March 1, 1919. If the war is then in progress, it is extended to March 1, 1920. No provision is made for a later date, it being the theory that the Legislature would then be in session, and could deal with the situation as conditions warranted at that time.

"It will be noted that any cancellation of contracts is in no way contemplated by which the contractor or the surety company is to be relieved in any degree from the contractual obligations now existing. The right to cancel exists upon the failure of the contractor to perform the same, but in that event the contractor and surety company will be held responsible for any excess cost to the state, which may be occasioned by such failure and cancellation.

"While we are not warranted in believing that this bill will relieve all the difficult situations connected with the contracts in charge of this department, yet it is hoped that it will prove a practical solution in a large number of cases. We hope by its provisions to be able to present such inducements to the contractors and the surety companies as will encourage them to make a special effort to complete those portions of the roadway under contract which are torn up and which now impede traffic. If contractors have no alternative but to either complete the entire contract or have it forfeited, there are many cases where they will be positively unable to so complete, and the forfeiture of the contract will accomplish nothing, so far as practical results are concerned, and will merely involve the state in a mass of litigation. In the meantime, the roadway will lie unimproved. A considerable inducement to contractors will exist under this bill as upon the completion of the torn-up portion of the road they will receive their full 100 per cent for all work performed and completed, and will be relieved of the maintenance of that portion of the road. On the other hand, the state, and any political subdivision whose moneys are being used by the department, are protected to the same extent as at present, by the renewed assurance of the completion of the road at the original contract prices.

"While the bill was pending in the legislature a conference was held in the attorney-general's office, at which were present the commissioner of highways, the attorney-general, the state superintendent of insurance, and representatives of all the bonding companies acting as sureties on these contracts. As the result of the conference the surety company representatives stated that they felt the bill was fair in its provisions, and also stated that they would endeavor to co-operate with the state in making it effective."

SEWERAGE AND SANITATION

City Closes Part of War Chemical Plant.

Newark, N. J.—Half of the plant of the Butterworth-Judson Corporation on the Newark meadows, where sixty per cent of the picric acid used in making high explosive shells for this country and the allies is made, closed down for nearly a week when mayor Gillen, health officer Craster and a detail of health officials and police went to the factory and ordered that operations cease until control had been established over acid fumes. Closing of the rest of the plant was considered, but a test performed by the corporation for mayor Gillen, exhibiting the operation of a device that partly eliminated the fumes, proved satisfactory, and operation there was permitted to continue. Nitrous oxide fumes given off at the plant, caused mayor Gillen to take his action upon advice from city attorney Kearns that the fumes constituted a nuisance, and that there was summary power in the hands of the city to abate such a nuisance. "I do not wish to persecute any one, nor to appear in the light of interfering with a necessary industry," said the mayor. "But I feel that these people have been given enough time to abate this nuisance, and we simply had to act. The closed portion of the plant will remain in charge of the health department until such time as the company can satisfy us that adequate measures have been taken to end the nuisance. I shall go personally to the plant daily, ready to be convinced by suitable evidence that the company has met our requirements. Until that time it must remain closed." Chief inspector Brady, with five sanitary inspectors, were left in the shut-down portion of the plant to see that it remained closed. Meanwhile the company rushed work on a tower under construction for the purpose of absorbing the objectionable fumes. Mayor Gillen promised to allow the plant to resume operation as soon as the work was finished and satisfactory. When temporary fans had been installed and the War Department had given assurances that new fans would be rushed, the closing order was rescinded. The company has stated that it will seek redress for losses. The company has been twice indicted within a few months by the Hudson County grand jury for maintaining a nuisance. The company, with its officials, were tried, convicted and fined the first time and has just been indicted again.

Operates Sewer System Without Permit.

Grass Valley, Cal.—The city trustees have received a communication from the state board of health, notifying the city that it has no permit to operate a sewer system, as required by law. The city has maintained a sewer system for nearly fifteen years, not knowing that a permit was needed. It was intimated that radical changes in sewage disposal methods might be demanded by the state board.

Typhoid Traced to Sewer Conditions.

Royal Oak, Mich.—Typhoid fever outbreaks in Royal Oak village are said by state health board representatives to be due not to the water supply, but to the sewerage conditions in the village. Survey of the sewerage system has shown that the village residents are depending in many cases on septic tanks built on low lands, where flood conditions cause trouble, or on open cesspools. The commission is considering a bond issue to provide for a more adequate sewerage system, but concern is expressed as to whether the government will give approval to the bonds. If approval is refused it is likely that an effort will be made to pass an ordinance requiring strict specifications for septic tanks, and enforcing their being built.

WATER SUPPLY

Law Protects New York's Watershed.

New York, N. Y.—Governor Whitman has signed the bill of senator George A. Slater, abolishing the Mohansic State Hospital and the New York State Training School for Boys in the town of Yorktown, Westchester County, and making a state reservation of the property, to be known as the Mohansic Lake Reservation. The bill provides for the abandonment of the project to establish the Mohansic State Hospital for the Insane on a 600-acre tract in the heart of the Croton watershed. It also limits the number of persons that may be placed on the adjacent 500-acre site of the New York Reform School for Boys at Yorktown Heights to fifty. This includes boys, guards and teachers. Originally the Mohansic institution was planned for the accommodation of 6,000 patients and the Yorktown Heights school for 800 delinquents. The governor is to name a commission to have charge of the property, and the members are to serve for five years without compensation. The commissioners may permit establishment on the reservation of places for food and refreshment, golf courses, baseball grounds and children's playgrounds. The commission also is empowered to permit the New York Society for Reformation of Juvenile Delinquents to use part of the land for agricultural purposes. The approval of the bill by governor Whitman means victory in a fight that has been carried on for the last five years by the Merchants' Association, through its Committee on Pollution and Sewerage, of which Edward Hatch, Jr., is chairman. Mr. Hatch, soon after the land for the two institutions had been acquired, took the stand that the location of a hospital and a reform school in

the Croton watershed was a distinct menace to the purity of New York City's water supply. Mr. Hatch petitioned governor Sulzer to have the law providing for the location of the two institutions in the watershed repealed on the ground that sewerage from the institutions would imperil the health of New York City. The matter was referred to Dr. Eugene H. Porter, then state health commissioner, who disapproved of the plan. A bill was then introduced repealing the law. It passed both branches of the legislature, but was vetoed by governor Glynn in deference to a request from Dr. Goldwater, then health commissioner of New York City. Dr. Goldwater had acted under instructions from mayor Mitchel, who, like his predecessor in the mayor's office, was in favor of having the hospital located conveniently to New York City. When the dangers were pointed out to mayor Mitchel he promptly reversed himself. Governor Whitman by that time had taken office. He at first opposed any check to the development of the two sites, but he also changed his mind and ordered all construction work stopped. He has remained steadfast ever since in opposition to the pollution scheme despite the fact that political pressure was brought to bear.

City to Buy Water Plant.

Bayonne, N. J.—By a vote of 4 to 1 the city commissioners have passed the ordinance providing for a contract for the city to purchase the property of the New York and New Jersey Water Company for $2,017,000. Mayor Pierre P. Garven voted in the negative. The ordinance provides that the purchase be consummated within twenty days. Petitions protesting against the purchase of the plant without first having the voters approve it already have been placed in circulation, the movement being in charge of county physician Bert Daly, formerly mayor of Bayonne.

City Loses in Waterworks Franchise Case.

Ashland, Ky.—A decision given by the circuit court of appeals requires the litigation between the city of Ashland and the Ashland Waterworks Company to be fought all over again in order to settle whether or not the city is to buy out the company or is bound to grant it another twenty-year renewal of its franchise. Kentucky's present constitution limits municipal indebtedness. The city had the right to buy at the end of twenty years, and on its failure to do so the franchise was to be extended for another period of similar length. The city elected to buy, but could not because the state constitution stops it from issuing the required amount of bonds. The company sued to compel specific performance, but judge Cochran, in the Kentucky federal court, dismissed its case. His decision is now reversed in an opinion favorable to the water company, and a new trial is directed.

STREET LIGHTING AND POWER

Will Not Reopen Rate Increase Cases.

Trenton, N. J.—Application of Jerome T. Congleton, as city counsel for Newark, for a rehearing of the case which led to authority from the state board of public utility commissioners to the Public Service Gas Company and the Public Service Electric Company to increase rates for gas and electricity has been denied by the commission. Mr. Congleton's application was based on an argument that the commission made an order which was to become effective prior to the date of such order, when the statute requires orders of the board, except in certain specified cases, to be made effective not less than twenty days after the date of the order. Mr. Congleton asked the commission to make orders fixing the effective date for the increases in the price of gas and electricity at a time twenty days after the authority was granted to the gas and electric company; that is, twenty days after February 27. Mr. Congleton's case was that the bills of the gas and electric companies carrying the first increase in rates were for gas and electricity furnished to consumers before the date of granting the authority to increase, and that as effectiveness of the authority was made retroactive it was illegal. The utility law specifically provides that orders shall not be effective until twenty days after they are made. In the present case the commission takes the position that an order was not issued in this case and that for this reason the argument advanced by Mr. Congleton for a rehearing is not sound. Disposing of Mr. Congleton's petition, to which the Edison Storage Battery Company was a co-petitioner, the board says that the hearing on the petitions of the gas and electric companies were attended by counsel for many municipalities of the state, and it was distinctly stated that the rates proposed were to be effective to cover meter readings made in the latter part of February and billed on or about March 1, and that this course appeared to meet with the approval of all of the parties present. The board, February 27, concluded to permit the increases proposed and to withhold an order of suspension if the tariffs filed were amended to conform with certain changes suggested by the commission. These amendments were made. No orders of any kind were entered. The commission then says that it appears, therefore, that the billings made subsequent to the filing of the board's reports were under the amended tariffs filed by the companies. "There does not now appear," comments the commission, "any reason for entering any orders. None was needed to make the rates effective. If the board should deem it expedient to enter orders making the emergency orders effective at a future date it has no power to award reparation, even if it should conclude that any rates imposed were illegal. The situation seems to have been understood by all parties at the hearing. It may not be amiss to point out that the granting of the petition would not result in any substantial relief to the petitioner. The rates are purely temporary and for an emergency. The companies were found to require temporary revenues during the calendar year 1918. If the increases were to be applied to the latter months of the year only it appears certain that higher rates would be necessary to afford the needed revenues to cover fixed charges of the calendar year than if they were applied for a longer period of time. In addition to this fact the board is requiring monthly detailed statements to be filed so that adjustments of rates may be made as speedily as conditions warrant. For these reasons it appears that no injury results from the application of the increases to the first readings taken after the filing of the new tariffs. The same reasoning applies to the suggestion that the companies' estimates of taxes paid included assessments which are now subject to attack in the courts. The board will keep check upon these matters and will be guided in the matter of reductions of rates as actual conditions warrant. The companies will not be permitted to receive more than it is shown from inspections of the detailed monthly statements to be required to meet the needs as found by the board and indicated in its reports."

Fuel-Saving Administrator in Pittsburgh.

Pittsburgh, Pa.—The United States Fuel Administrator has announced the appointment of Thomas R. Brown, of Pittsburgh, as administrative engineer for the Pittsburgh district, and C. P. Billing as special staff assistant. These appointments were made as a preliminary step toward putting into operation a general plan for fuel conservation in power plants. The plan contemplates the saving of from 10 to 20 per cent—25,000,000 to 50,000,000 tons—of the coal used annually in industrial plants. This will be accomplished by means of correct operating methods without the delay and expense involved in the installation of new or improved equipment. The program is at present in effect in the Pittsburgh district, which will be used as a model, with the expectation that the campaign for the elimination of waste will be extended to all of the principal coal using districts. The program comprises certain fundamentals: 1—Personal inspection of every power plant; 2—Classifications and rating of every power plant based upon the thoroughness with which the owner conforms to recommendations of the United States Fuel Administration involving the generation and use of power, heat and light; 3—An administrative engineer to be placed in charge of the work in each state or district. It will be one of his duties to rate the plants from information received through reports of inspectors, who will merely act to collect certain definite information regarding each plant.

Company Must Make Extensions.

San Francisco, Cal.—The state railroad commission has authorized the Mount Whitney Power and Electric Company, which sells electricity in Tulare, Kern and Kings Counties, to put into force certain rules for extensions of electric service during the period of the war. These rules obligate the company at its own expense to make all extensions in which the annual gross revenue equals a third of the cost. Where the annual gross revenue is less than the cost of the extension, but more than one-fifth, the company will give the service if the consumer advances the entire cost, which will be refunded to him on the basis of 20 per cent. of the monthly bills. The consumer may at his own cost build enough of the extension so that the amount to be expended by the company shall not be more than three times the annual payment for service by the consumer. The Mount Whitney company is ordered to adjust all extensions made by it within one year prior to this order, if requested by the consumer.

FIRE AND POLICE

Power Plant Destroyed by Fire.

Sault Ste. Marie, Ont.—The Canadian Soo experienced a lightless, powerless day as the result of a fire which totally destroyed the old power plant of the Great Lakes Power Company. The building and contents were valued at $200,000, covered by insurance, and practically everything is a complete loss. Until power could be supplied by the new power plant, which was almost completed, the city was industrially dead. Thousands were out of work. All industries were shut down; no street cars running and no lights operating. The water supply was not affected as the pumps were switched to steam power as soon as the electricity went off. Wards five and six, once Steelton, however, used chlorinated water, as a supply could not be pumped from the old Steelton artesian wells. Steelton had no auxiliary pumps. The fire, it is thought, started from a heated bearing under the floor and spread rapidly to all parts of the building over oil-soaked planking. The operator of the water wheel near where the first flame appeared was powerless to extinguish the blaze, and was driven out by dense smoke fumes. Every fire wagon in the city was at the conflagration. The power franchise was secured some months ago by the Great Lakes Power Company, who now control the power and street car systems. The city owns the water and light business, and was a loser in the fire to the extent of a big transformer at the power plant. Most of the directors of the power company are Americans.

Boston Fire Commissioner Retires.

Boston, Mass.—Fire commissioner John Grady of Boston voluntarily retired this month, on the pension of a chief of the department, which is $2,000 annually, or half the regular pay of a chief on the active list. On May 2 he completed 44 years' service upon the active list of the Boston fire department. During his term the department has been devoid of scandals and friction, there has been general satisfaction among the men of the rank and file, many improvements have been made and the fire losses have gradually and substantially decreased each year. During his term commissioner Grady has handled more than $8,000,000, and at no time has he exceeded his annual appropriation. In the same time the pay of the firemen has been substantially increased, the men have been granted one day off in three instead of one in five as previously, about two hundred men have been added to the fire fighting force, and the new rules and regulations which were begun by commissioner Wells have been revised and put into service. The department has been motorized to the extent of 54 per cent. Many new fire-houses have been built and all old ones have been substantially remodeled and fire-proofed. Commissioner Grady established the officers' school for training superiors of the force, established the rescue squad equipped with gas masks, has purchased a superior quality of fire hose, and the department has also taken over the great work of fire prevention and makes more than 36,000 inspections a year. One reason which influenced commissioner Grady to ask mayor Peters to place him upon a pension is the complete loss of the sight of his right eye, a misfortune of which few persons are aware. On March 10, 1914, the general order placing chief Grady upon retirement was promulgated, but with the provision that he was not to receive his pension until his term as fire commissioner ended. Commissioner Grady was appointed to the department on May 1, 1874. He worked his way along the various grades to chief and commissioner and his is the only instance of the kind in the history of the department.

Town Swept by Fire.

Three Rivers, Quebec.—Fire which broke out in the business section here quickly destroyed forty houses on Bonaventure street, the main business thoroughfare. The flames spread to the nearby streets, and the families were compelled to leave their houses because of the unbearable heat. Help was asked from Quebec and Montreal. Three Rivers, an industrial and manufacturing city of about 10,000 population and a port of entry, is seventy-five miles southwest of the city of Quebec. It was visited by a disastrous fire in 1906, when half of the city was burned.

Many Firemen Injured in Warehouse Blaze.

New York, N. Y.—Fire caused the death of one man and did $500,000 damage in the cold storage warehouse covering the entire city block, owned by the Merchants' Refrigerating Company, and in which were stored large quantities of food and other war supplies belonging to the federal government for transportation overseas. Three alarms were turned in. The fire started in an engine room located in the basement, thirteen feet below the street level, and was caused, it was said, by the blowing out of a cylinder head on a machine which condenses ammonia gas to be forced through the pipes and 140 tanks located in the structure. Four men were in the room at the time of the explosion, which started the flames, and three of them escaped to safety on the street, where they turned in the alarm. The fourth, assistant superintendent, was pinned under falling debris, and his badly crushed body was found after a search of several hours. The rescue squad of the fire department arrived and, donning oxygen helmets, entered the building to search for the missing man, but were driven back by flames and fumes. A second explosion occurred, caused, it was said, by the blowing up of the ammonia tanks. A number of regular army soldiers guarding the waterfront were knocked down by the explosion. Thirty firemen, who were trying to batter down the doors, were thrown off their feet and a number of them injured by shock, flying debris and gassed by the powerful ammonia fumes. Lieutenant George E. McAvoy of engine 34 and lieutenant Thomas Foley of engine 3 were both so badly injured from falling material and ammonia fumes that they were given the last rites. The building, which was said to be the most modern in the United States and one of the largest in the world, was finished only in January.

TRAFFIC AND TRANSPORTATION

New York Commission Powerless to Raise Fares.

Albany, N. Y.—Increased rates in all public utilities, especially in fares on street railways throughout the state, have received a serious setback in the decision of the state court of appeals in the recent Rochester case. According to the decision, the power of the commissions to grant higher fares to deserving railways is in general restricted to those cases where the rates are not fixed in franchises. The court finds that the exisiting public service commission act does not show any intent to provide for the regulation of franchise rates, although it permits the revision of rates fixed by old statutes. Moreover, although it is said to be unnecessary and therefore improper to decide now the limits of legislative power over franchise rates, the court states that such rates fixed in accordance with the constitutional requirement of

municipal consent for electric railway operation are not subject to legislative alteration. This decision was handed down in the case of Quinby vs. the city of Rochester. The case came to the court through the denial by lower courts of a writ of prohibition to prevent the public service commission for the second district from exercising jurisdiction over the petition of the New York State Railways for a six-cent fare. The court of appeals decided that the second district commission is without jurisdiction in the Rochester case, and that an absolute writ of prohibition should be awarded. The decision was written by Judge Pound, with Judges Cuddeback, Cardozo and Andrews concurring. Although it expresses the impropriety of now deciding the point, the court intimates that in view of the constitutional requirement in New York for municipal consent to utility operation, franchise rates are unalterable except with municipal permission. The court thus raises the doubt whether the legislature has power to grant relief from franchise restrictions. On the question of whether the commission's jurisdiction is restricted by the Rochester charter amendment which fixes the five-cent fare, the court says:

"The policy of the state is said to be that the Public Service Commission should deal with the regulation of rates of fare charged by railroad corporations without limitation or restraint, and with the power to increase as well as decrease such rates. (People ex rel. N. Y. & N. S. Traction Co. v. Public Service Commission, 175 App. Div. 869; People ex rel. Ulster & D. R. R. v. Public Service Commission, 171 App. Div. 607, 611; affd., 218 N. Y. 643.)

"The section [Section 49, subdivision 1, of the public service commission law], read as a whole, is susceptible of no other natural interpretation than that the Legislature has, for greater certainty, expressly included in its general delegation of powers, the power of the commission to reduce a maximum rate *fixed by the Legislature*. The purpose of the Legislature was to provide for the regulation of statutory fares by a board which may be expected to pass equitably upon conflicting claims with its single purpose the common good, even where a maximum rate had been fixed by the Legislature.

"The case of Willis v. City of Rochester (219 N. Y. 427) merely upheld the charter amendment as a constitutional exercise of the legislative power to fix rates. Rates so fixed by special statute are still subject to regulation by the Public Service Commission. The jurisdiction of that body over such rates is not to be reduced by implication. The Legislature merely fixed the rate *pro tempore*."

Concerning the consent of the local authorities required by the constitution the court states in part:

"The power of the local authorities to impose as a condition to giving consent to the construction and operation of a street railroad that a stipulated rate of fare should be charged has been repeatedly upheld. (People ex rel. West Side St. Ry. Co. v. Barnard, 110 N. Y. 548; Kittinger v. Buffalo Traction Co., 160 N. Y. 377, 391, 392; Public Service Commission v. Westchester St. R. R., 206 N. Y. 209; People ex rel. Frontier Elec. Ry. v. City of North Tonawanda, 70 Misc. Rep. 91; Alleheny City v. Millville, A. & S. J. Ry., 159 Pa. St. 411.) But these cases dealt with the question of local power over the corporation and not with the question of general legislative power over the municipality. The question presented is this: The consent of the local authorities being obtained, what jurisdiction has the Legislature conferred upon the Public Service Commission to regulate rates by increasing the rate agreed upon without such consent?

"It has been held that the Legislature may, by virtue of its general power over municipalities, regulate the mode and manner in which the consent of the local authorities to the construction and operation of street railroads shall be given, and may regulate and limit by statute the conditions upon which it may be given. (Matter of Thirty-fourth St. R. R., 102 N. Y. 343; Beckman v. Third Ave. R. R., 153 N. Y. 144, 152; People ex rel. S. S. Traction Co. v. Wilcox, 196 N. Y. 212.) Regulations are so made in certain cases by the railroad law, Section 173, but that section expressly provides that nothing therein contained shall be construed as modifying or affecting the terms of the contract between the City of Rochester and the street railroad, and it looks to the future and does not attempt to regulate consents already granted.

"The Constitution does not expressly provide that the municipality may irrevocably establish rates for the entire period of a franchise, and it has been held invariably and in a legion of cases that such power to establish rates is not essential to the consent of local authorities and will not be implied and that the Legislature is at all times supreme in the matter. (Home Telephone & Tel. Co. v. City of Los Angeles, 211 U. S. 265; Arlington Board of Survey v. Bay State St. Ry., 224 Mass. 463; State ex rel. Webster v. Superior Court, 67 Wash. 37; L. R. A. 1915, C. 287; State ex rel. M. S. R. R. v. P. S. C., 168 S. W. Rep. 1156; City of Manitowoc v. M. & N. Traction Co., 145 Wis. 13; City of Dawson v. Dawson Tel. Co., 137 Ga. 62; City of Woodburn v. Public Service Commission, 82 Ore. 114; L. R. A. 1917, C 98; Collingswood Sewerage Co. v. Borough of Collingswood, 91 N. J. L.).

"In all such cases the question was one of unrestricted legislative power, policy and discretion over a city or town where the local authorities were held to be mere instrumentalities through which the state exercised its sovereign power. The paramount power of the Legislature over the subject of fares was upheld in the absence of a constitutional limitation.

"But our Constitution, by requiring the consent of the local authorities, recognizes that our municipalities are *pro tanto* independent of legislative control, exercising some fragment of power, otherwise legislative in character, which has been thus irrevocably transferred by the fundamental law from the Legislature to the locality. The grant by the municipality of authority to use the streets is not a mere privilege or gratuity. Once accepted, it becomes a contract which neither the state nor its agencies can impair. (People v. O'Brien, 111 N. Y. 1.)

"It is urged by the appellant . . . that the Public Service Commission has no jurisdiction over the subject-matter of rate regulations in the city of Rochester because the Legislature has no power to alter the rates fixed by consent of the company and the local authorities. It is, however, unnecessary and, therefore, improper to decide at this time what the limits of legislative power are in this connection. The delegation of legislative power to commissions and other administrative officers and boards need not be assumed if the general words from which such delegation may be inferred are not reasonably so construed."

Previous to the decision the commission for the second district had awarded fare increases to a number of companies, but to none after it. The commission for the first district had taken the view held in the decision of the court of appeals.

Company's Payments Into Chicago Traction Fund.

Chicago, Ill.—The Chicago Surface Lines, which include the local street car companies, have paid into the city's traction fund for the fiscal year ended Jan. 31, 1918, $2,036,754. This was a decrease of $710,235 as compared with the city's share in the preceding year. With this addition the traction fund reaches to a total of almost $24,000,000, representing 55 per cent. of the net receipts during the last ten years and accumulated interest. If the ordinance under consideration is finally approved it is probable that this money will be used for building subways to be owned by the city and leased to the companies.

LEGAL NOTES

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Sale of Materials by Councilman.

(Mich.) Member of common council selling materials to contractor without any previous agreement or understanding held not interested in the contract with the city within the prohibition of Grand Rapids City Charter, §498.—People v. Southern Surety Co., 165 N. W. 769.

Police Pensions—Repeal of Statute.

(Cal.) Where pensions for policemen are predicated merely upon death occurring during period of service, and death only fixes the right to a pension, a repeal of the pension statute before death destroys the pension right.—O'Dea v. Cook, 169 P. 366.

Municipal Plants—Management—Court Jurisdiction.

(Ohio) Courts cannot interfere with municipal officials' management of light, power and heating plants on complaint that capacity of plant is overtaxed, that streets are insufficiently lighted because of light supplied to private consumers, and that rates charged are inadequate to meet cost of production and transmission.—Butler v. Karb, 117 N. E. 953.

Under Gen. Code, §3618, and section 3939, subd. 12, as amended by 105-106 Ohio Laws, p. 538, powers of municipalities to establish and operate lighting, power and heating plants, and furnish the municipality and its inhabitants light, power and heat are proprietary, and in the management of such plant municipal officials have a wide discretion.—Id.

Police Pensions—Removal—Reinstatement.

(Ill.) A police captain held entitled to a pension under Pension Act, §§3-6, notwithstanding removal under the Civil Service Act of June 10, 1911.—Stiles v. Board of Trustees of Police Pension Fund of West Chicago Park Commissioners, 118 N. E. 202.

An applicant for police pension under Pension Act does not waive his right thereto because he has brought suit for reinstatement on the police force.—Id.

NEWS OF THE SOCIETIES

CALENDAR OF MEETINGS.

May 15-22.—NATIONAL CONFERENCE OF SOCIAL WORK.—Annual conference, Kansas City, Mo. Secretary, William T. Goss, 315 Plymouth Court, Chicago, Ill.

May 20-22.—SOUTHEASTERN SANITARY ASSOCIATION. Annual meeting, Knoxville, Tenn. Secretary, Dr. Charles E. Smith, Greenville, S. C.

May 21-23.—ARKANSAS ASSOCIATION OF PUBLIC UTILITY OPERATORS. Annual convention, Hot Springs, Ark.

May 27-June 1.—CANADIAN PUBLIC HEALTH ASSOCIATION. Meeting with Ontario Health Officers' Association, Hamilton, Ont. Secretary, J. G. Fitzgerald, Toronto, Ont.

May 27-29.—NATIONAL CITY PLANNING INSTITUTE. Annual conference, St. Louis, Mo. Secretary, Flavel Shurtleff, 19 Concress Street, Boston, Mass.

June 4-6.—INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS. Annual convention, Chicago, Ill. Secretary, Chief James McFall, P. O. Box 1015, Washington, D. C.

June 4-7.—AMERICAN SOCIETY OF MECHANICAL ENGINEERS. Spring meeting, Worcester, Mass.

June 5-7.—NATIONAL MUNICIPAL LEAGUE. Annual meeting, New York, N. Y. Secretary, Clinton Rogers Woodruff, North American Bldg., Philadelphia, Pa.

June 13, 14.—NATIONAL ELECTRIC LIGHT ASSOCIATION. Annual meeting, Hotel Traymore, Atlantic City, N. J. Secretary, T. C. Martin, 33 West 39th St., New York City.

June 11-13.—MAYORS AND OTHER CITY OFFICIALS OF NEW YORK STATE. Annual conference, Newburgh, N. Y. Secretary, William P. Capes, 25 Washington St., Albany, N. Y.

June 19-21.—NATIONAL ASSOCIATION OF COMPTROLLERS AND ACCOUNTING OFFICERS. Annual meeting, Atlantic City, N. J.

June 19, 20.—LEAGUE OF TEXAS MUNICIPALITIES. Sixth annual convention, in cooperation with the Texas Commercial Executives' Association, San Antonio, Tex. Secretary, Edward T. Paxton, University of Texas, Austin, Tex.

June 24-26.—AMERICAN CONCRETE INSTITUTE. Annual meeting, Atlantic City, N. J.

June 25-28.—AMERICAN SOCIETY FOR TESTING MATERIALS. Annual meeting, Atlantic City, N. J. Secretary-treasurer, Edgar Marburg, University of Pennsylvania, Philadelphia, Pa.

June 26-28.—AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS. Annual convention, Atlantic City, N. J. Secretary, F. L. Hutchinson, 33 West 39th St., New York City.

American Institute of Electrical Engineers.

The thirty-fourth annual convention of the American Institute of Electrical Engineers will be held in the Marlborough-Blenheim Hotel, Atlantic City, N. J., June 26 to 28. A large attendance is expected because of the importance of the topics to be discussed, these dealing chiefly with problems connected with the generation and transmission of electrical energy. The tentative program of papers and addresses is as follows:

Wednesday, 10:30 a. m.—Opening address by President E. W. Rice, Jr.; reports of technical committee.

Wednesday, 2:30 p. m.—"Split-Conductor Cables—Balanced Protection," by William H. Cole; "Overhead Transmission Cables," by E. B. Meyer; "The Application of Theory and Practice to the Design of Transmission-Line Insulators," by G. I. Gilchrist.

Thursday, 10:30 a. m.—"Lightning-Arrester Spark Gaps," by C. T. Allcut; "The Oxide—Film Lightning Arrester," by C. P. Steinmetz; "Design of Transpositions for Parallel Telephone and Power Circuits," by H. S. Osborne.

Thursday, 2:30 p. m.—Conference of section delegates.

Thursday, 8:30 p. m.—"Fixation of Nitrogen," by E. Kilburn Scott; "America's Power Supply," by C. P. Steinmetz.

Friday, 10:30 a. m.—"Precharged Condensers," by V. Karapetoff; "Method of Symmetrical Co-ordinates Applied for the Solution of Polyphase Networks," by C. L. Fortescue; "Flux Distribution in Alternators Under Sustained Short-Circuit Conditions and Different Loads," by N. S. Diamant.

Friday, 2:30 p. m.—"Protection from Flashing in Direct-Current Apparatus," by J. J. Linebaugh and J. L. Burham; "The Automatic Hydroelectric Plant," by J. M. Drabelle and L. B. Barnett.

National Electric Light Association.

A meeting of all of the electrical interests on the Pacific Coast was held in Del Monte, Cal. The National Electric Supply Jobbers of the Pacific Coast met there on Monday, May 6, the California Association of Electrical Contractors and Dealers convened on Tuesday, and the delegates of the National Electric Light Association arrived on Thursday. Some of the important papers presented were: "Possible Water-Power Development in California," by F. H. Fowler; "Joint Operation of Power Companies," by J. P. Jollyman; "Power-Plant Losses," by R. J. C. Wood; "Transmission and Distribution Losses," by R. E. Cunningham; "Iron and Steel Conductors," by R. C. Powell; "Standardization of Pin-Type Insulators," by L. M. Klauber and R. E. Cunningham; "Substitute for Cedar Poles," by L. M. Klauber, and "Insulator Deterioration," by J. A. Koontz. There were also papers on commercial, accounting and contractors' problems.

Southwestern Electrical and Gas Association.

Four addresses and two papers were features of the opening sessions of the recent fourteenth annual convention of the Southwestern Electrical and Gas Association in Hotel Galvez at Galveston.

The address of welcome was delivered by mayor I. H. Kempner. Response was made by W. B. Head, of Dallas, vice-president of the Texas Power and Light Company. H. C. Morris, president of the association and vice-president of the Dallas Gas Company, spoke on the manner in which the war has affected the gas and electrical business. Lynton T. Block, president of the Employers' Indemnity Association of St. Louis, delivered an address on "The Possibilities of Jovian Insurance." Edward F. Harris, of Galveston, delivered a patriotic address on "War Savings, the Solution of Our National Problem." Mr. Harris was given a rising vote of thanks upon completing his remarks. F. I. Weisser, superintendent of the gas department of the San Antonio Public Service Company, read a paper on "The Manufacture of Balloon Gas." The paper was filled with interesting information and was a feature of the opening session. H. E. Danner, commercial manager of the Houston Gas and Fuel Company, read a paper on "The Commercial End of the Gas Business."

The Street and Interurban Railway Section session was held at 2 p. m. that afternoon. The Gas Section session was held at 2. p. m. in the Gold Room at which F. D. Murphy, general manager Houston Gas & Fuel Company, was chairman. "The Commercial End of the Gas Business," by H. E. Danner, commercial manager Houston Gas & Fuel Company; "The Manufacture of Balloon Gas," by F. L. Weisser, superintendent gas department, San Antonio Public Service Company; address, "What Will Be the Next Turn in the Gas Business?" by the chairman; question box and discussions; new questions brought in by members; election of section chairman.

At the second day's session reports were made by H. S. Cooper, secretary of the executive committee, during which he displayed a geological map of Texas, in which the locations of the lignite beds were shown. These beds were found to be located near the cities where the largest public utilities plants in the state are being operated. Mr. Cooper said that the deposits would be useless unless steps were taken to make the fuel easier to handle. Upon suggestion of H. C. Morris, of Dallas, the committee agreed to consider sending two young men to the University of Texas to take a special course in geology to find a solution of the fuel problem through the lignite beds.

The question of increasing rates was discussed by nearly every one in attendance. The prevailing opinion was that eventually the rates must be raised because of the increased costs of labor and fuel. J. C. Kennedy, of Brenham, reported that some concerns have increased their rates without receiving complaints from the public. Others maintained that in nearly every instance the public probably would complain if the rates are increased, but that the public must be educated to the fact that it may be necessary to increase the rates on account of conditions being abnormal.

The question of obtaining sufficient labor during the war also was discussed. The delegates said that they were making the best of conditions under the circumstances, but all of the companies which they represent have

(Continued on page 423)

INDUSTRIAL NEWS

Cast Iron Pipe.—Government prices remain constant. Quotations: Chicago, 4-inch, Class B and heavier, $57.30; 6-inch, $54.30. New York, 4-inch, Class B and heavier, $58.35; 6-inch, $55.35; 3-inch, $65.35. Birmingham, 4-inch, Class B and heavier, $52; 6-inch, $49; Class A $1 extra.

The Brown Hoisting Machinery Co., Cleveland, O., announces that H. D. Wright, manager of its San Francisco office, Monadnock Building, is appointed Pacific Coast representative, succeeding the Colby Engineering Co. in the Northwest territory.

The Luitweiler Pumping Engine Co., Rochester, N. Y., announces the opening of an office in Chicago in charge of T. M. Weinstein, a factory representative of the company.

The Walter A. Zelnicker Supply Co., St. Louis, Mo., has issued Bulletin No. 241, listing its latest bargains in rails, cars and locomotives. Those in the market for such equipment should go through this bulletin before the opportunities are missed.

War Needs and the Steel Situation.

Every ton of steel and pig iron in the country virtually has been commandeered by the government for war purposes, and any surplus remaining after war needs are met, will be distributed to non-war industries under strict government supervision. This was learned officially following publication of minutes of a meeting attended by the chief steel men of the country.

Eight thousand tons of pig iron were taken from a large mill engaged in less essential work and shipped to a steel mill doing war work, which was about to close down because of pig iron shortage. Similar action has been taken more than once during the last few weeks, and the practice will be continued whenever steel mills and plants engaged in non-war work have steel for the government's war requirements.

A meeting of about fifty of the principal steel manufacturing companies, called at the request of Mr. J. L. Replogle, Director of Steel Purchases of the War Industries Board, was held recently at the office of President E. H. Gary of the American Iron and Steel Institute in New York, at which Mr. Replogle made a strong statement of the immediate and future requirements of the Government for steel in various forms for its military necessities, stating that they are so great as to demand the entire output of the industry in almost all lines. The manufacturers responded to Mr. Replogle's appeal for maximum production in the most patriotic spirit, and pledged themselves unanimously to give their best efforts to accomplishing maximum production, subordinating all commercial business to the Government's requirements. Every member of the American Iron and Steel Institute has been asked by Judge Gary to sign two copies of the pledge as adopted, to return one to James T. McCleary, secretary of the institute, retaining the other.

The pledge as signed by those who attended the meeting is as follows: "For myself, my corporation or my firm, I pledge the prompt production and delivery of the largest possible quantity of material in our departments that is or shall be required by the United States Government for the necessities of itself and its Allies, and agree that all other lines of our business shall be subordinated to this pledge, and all this in accordance with the request of the War Industries Board."

Data was presented by Mr. Replogle, relative to the present and prospective demand of the Government's shipbuilding program, also the steel plate demand that must be met from Allied countries, including 300,000 tons for Great Britain, 200,000 tons for Japan, 60,000 tons for Italy, and a considerable amount for Canada. The requirements of the car and locomotive program were also discussed and the measures which have been taken to reduce the amount of plates required for the new cars. Mr. Replogle urged that steel manufacturers concentrate upon government and other war steel, and on the railroad and equally important demand of essential industries, such as implement manufacture, mining of coal and other minerals, oil well work and industrial structural work resulting from the war. He made it plain that war and railroad demand would soon call for far more steel than the manufacturers had appreciated. He emphasized the shortage of steel plates up to this time, and indicated that full operation of plate mills on government and allied orders was essential for a considerable time, suggesting that to do this it might be necessary to ship pig iron from one district to another as well as steel ingots from works now devoted to other products than plates, so that plate mills and their connected steel works could run to their utmost capacity.

It is estimated that in spite of shortages of coke, pig iron, labor and transportation facilities, shipments of finished products for governmental and other essential purposes are being made at the rate of approximately 33,000,000 tons per annum.

The steel trade has a general understanding that the United States Government has planned and now has under construction a big building program covering shops, warehouses and other structures, but it is not believed that any one outside the circle of the War Industries Board knows that during the current year the government will use 20 per cent more building material, including structural shapes, than the average consumption of the entire country during the three years 1914, 1915 and 1916.

The recent meeting is accepted as marking the beginning of a move to classify steel-using industries, to develop a preferential list and to apportion output among both the essential and less essential industries.

NEWS OF THE SOCIETIES

(*Continued from page 422*)

lost many capable employes on account of the draft. Some of the companies are training men who are not subject to draft to take the places of men who have been called.

R. W. Van Valkenburgh, of Dallas, Texas, general manager of the Western Electric Company of Texas, read a paper on "Suggestions for Conservation in Purchasing from the Seller's Standpoint." The paper contained suggestions that might be used by the sellers and pointed out the necessity of conservation. The paper was followed by discussions on the subject.

The election of officers for the ensuing year resulted as follows: President, W. A. Sullivan, Shreveport, vice-president and general manager of Shreveport Railway Company; first vice-president, Burr Martin, Dallas, general manager of Texas Electric Railway; second vice-president, E. S. Fletcher, general superintendent of Texas Power & Light Company, Dallas; third vice-president, A. Hardgrave, chief operating engineer of Southwestern Utilities Company; treasurer, J. B. Walker, Dallas; secretary of executive committee, H. S. Cooper, re-elected.

Oklahoma Gas, Electric and Street Railway Association.

The Oklahoma Gas, Electric and Street Railway Association recently held its seventh annual convention at Oklahoma City. A number of matters of vital interest to the public utility companies were considered in the addresses, papers and discussion. In order to properly gather and disseminate facts of interest to companies and persons supplying utility service, the convention decided that the association employ a secretary for such work. The selection of a secretary was placed in the hands of the state executive committee of which John W. Sharlet is chairman.

The first session met on Monday afternoon. Mayor Overholser of Oklahoma City made an address of welcome, and F. D. Shaffer, manager of the Chickasha Gas & Electric Company gave his presidential address, the keynote of which was co-operation on the part of the utilities of the State to relieve the present financial stringency and effectually prosecute the war.

C. W. Shannon read a paper on "The Reliability of the Oklahoma Oil and Gas Fields." Mr. Shannon predicted that in the near future it would be possible to predetermine the life of Oklahoma oil and gas wells. The convention then adjourned to inspect the new

waterworks project built for the supply of Oklahoma City at a cost of $1,500,000.

The second day's session was featured by the following. Electric Railways and the War—Guy B. Treat, chief engineer, Oklahoma Railway Company; Oklahoma Utilities and the War—Prof. L. W. W. Morrow, University of Oklahoma; High-Tension Transmission and Distribution—Lee Boyer, engineer, Choctaw Power & Light Company; Gas-Fired Boilers—L. A. White, superintendent, Muskogee Gas & Electric Company.

Interesting discussion followed the address under each heading.

John W. Shartel thought the adoption of a six-cent fare would hardly solve the problem and that a cut in the service seemed the logical step to meet a situation caused by advancing prices of everything that the railway company uses in operating.

After hearing the papers of Guy B. Treat, chief engineer of the Oklahoma Railways Company, and Prof. L. W. W. Morrow of the University of Oklahoma, the convention went on record in support of the National Committee on Public Utility Conditions appointed by the National Electric Light Association, the American Gas Institute, the National Commercial Gas Association and the American Electric Railway Association. It passed a resolution to the effect that the Oklahoma sub-committee of the national committee be empowered to engage a high-grade man to handle the work of the associations in Oklahoma in connection with the granting of rate increases, the obtaining of financial aid from the War Finance Corporation and the obtaining of proper publicity for the utilities in the state, and in other ways to advance the interests and promote the welfare of the individual members of the association.

In discussing the papers, the consensus of opinion was that a rate increase was the only solution of present financial problems, and that such an increase ought to be granted upon proper presentation of facts with a minimum delay.

At the afternoon session C. S. Thompson and J. W. Shartel discussed the advisability of concentrated production, transmission and distribution of electricity in Oklahoma through the use of a few large stations.

The discussion of the paper by L. A. White, entitled "Gas-Fired Boilers," dwelt on the fact that a large combustion chamber was the essential prerequisite for the efficient use of gas under boilers.

At the Tuesday morning session L. E. Mohrhardt read a paper on the use of electricity in the oil and gas fields of the state. Discussion brought out the point that the load obtainable in the oil and gas fields would be advantageous to central-station men from every standpoint, but that there had been no attempt to get this load. One of the difficulties is the necessity for costly equipment and high-tension lines.

On the closing day the interest centered on the subjects treated in the following addresses: Needed Utility Legislation—Chas. Hoopes, assistant operating manager, Oklahoma Railway Company; Utility Taxation—Prof. F. F. Blachly, University of Oklahoma; Relations of the Utilities and the Public—A. L. Mitchell, engineer, Corporation Commission; Relations to Customers—W. T. Dibbens, manager, Guthrie Gas Company.

In the course of the discussion the habit, in some quarters of stealing electric current, gas and water was repeatedly referred to. One speaker said the opinion that stealing from a corporation was not a serious offense had become entirely too popular; and legislative action was asked to provide a specific penalty for offenses of this kind.

Discussion also developed a demand for a state law to license engineers of public utility plants.

PERSONALS

Cochrane, Victor H., engineer of bridges of Kansas City, Mo., has been appointed major in the quartermaster corps, National Army, and has been assigned to duty in connection with the construction division, Washington, D. C.

Durkin, W. H., engineer of the department of public sanitation, Indianapolis, Ind., has become a member of the engineering staff of the Industrial Bureau of Housing, Washington, D. C.

Goldsmith, Clarence, whose services during the past year have been contributed by the National Board of Fire Underwriters to the Government as advisory engineer on water supply and fire protection, has been commissioned as major in the quartermaster corps, construction division, of the National Army.

Learned, Albert P., who has been for five years assistant engineer with the consulting engineering firm of Black & Veatch, Kansas City, has been commissioned first lieutenant in the sanitary corps of the National Army and stationed at Camp Greenleaf, Chickamauga, Georgia.

McCabe, Arch., has been appointed chief of the Muncie, Ind., fire department to succeed John E. Casey, who has entered federal government service.

McKenzie, James, has been appointed county engineer of Morris County, Kan.

Whitten, Dr. Robert H., has been appointed consulting engineer to the city plan commission of Cleveland, O. He was until recently secretary of the city planning committee of New York City.

PROBLEMS CITIES ARE STUDYING WITH EXPERTS

Chester, Pa., is building a PARK BRIDGE. Plans and specifications for the structure were prepared by the engineer, James B. Long.

Plans are being drawn for a WATERWORKS PLANT for Bellefield, N. D., by the consulting engineer, L. P. Wolff.

Bryan, O., is to improve its WATERWORKS. A. H. Smith has been selected as the engineer to prepare plans and specifications.

STREET and SEWER IMPROVEMENTS are to be made by Mingo Junction, O. The engineer for the work is W. R. Walker.

A SEWER SYSTEM is to be constructed by Platte, S. D., plans and specifications for the improvement being in the course of preparation by the engineer, W. L. Bruce.

In making ROAD IMPROVEMENTS Lincoln, Price, Forest, Oneida and Langlade Counties, Wis., have had plans prepared by the engineer, H. Nelson.

Charlotte, N. C., is to improve its WATERWORKS by the installation of new pumping equipment. The municipal engineering firm of Anderson & Christie prepared the plans and specifications.

Troy, N. Y., is contemplating PARK DEVELOPMENTS. Preliminary plans for the improvements are being drawn by the landscape architect, Charles D. Lay.

The civic planning commission of Salt Lake City, Utah, has retained George E. Kessler, city planning expert and landscape architect, to develop a CITY PLAN.

Paris, Kan., is to construct WATERWORKS. Plans for the improvement have been completed by the consulting engineering firm of Winters & Dove.

Sandpoint, Ida., has voted $140,000 bonds for the construction of WATERWORKS. The consulting engineering firm of Burns & McDonnell is to have charge of the improvement.

The Arkoe (Mo.) Drainage District is to make some RIVER STRAIGHTENING and DRAINAGE improvements. Plans are in process of preparation by the consulting firm of Leslie-Barnes Engineering Co.

An experimental WATER FILTRATION and DISINFECTION PLANT is to be installed by Milwaukee, Wis. Joseph W. Ellms has been retained as consulting engineer to design the plant and have charge of the experimental work.